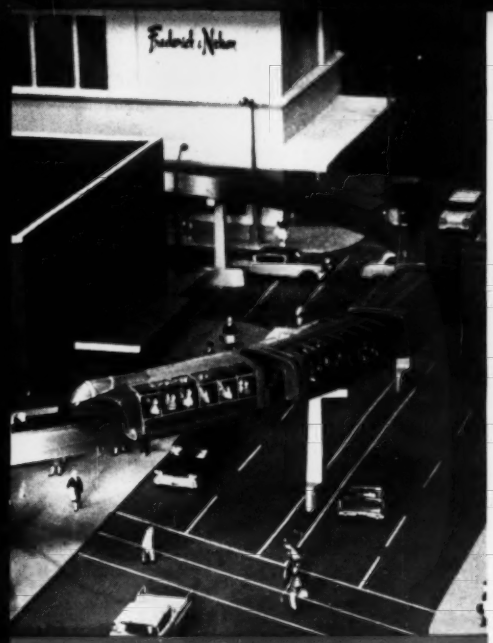


SEPTEMBER 7, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Monorails may signal . . .

City Transit Changes

City planners may revitalize the market for urban transit equipment and develop some astounding new markets for metalworking. Most major cities are engaged in long range planning, and transportation is an integral part of it. Several metalworkers are seriously evaluating the potential for monorails. Bus sales are reviving. Markets to watch are 25 cities that may have more than 1 million people in 15 years, and cities where most people work downtown . . . Page 58

Most Partmakers Won't Be Hurt by Steel Strike Until After Oct. 1

Look Where Plastic Tooling Is Going

Boom in Testing & Inspection Items

Drives Get Smaller but Handle More

Switch to Powdered Metal Saves 62%

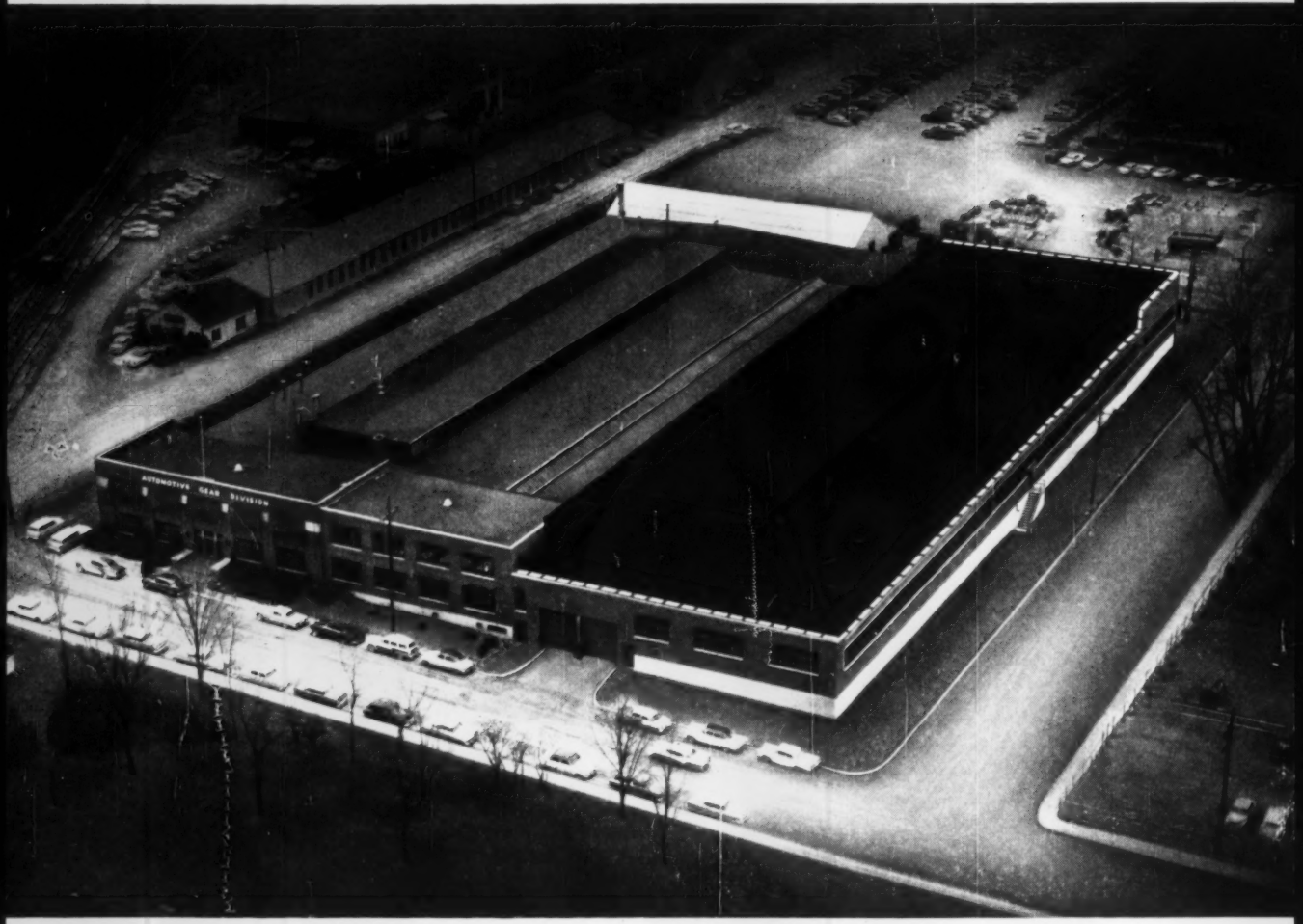
Titanium Maker Changes into Civvies

COMPLETE CONTENTS
TURN PAGE

METALWORKING OUTLOOK
PAGE 31

THIS MUCH MORE in '59

Expansion was not the order of the day during the past year, but it was in this period that the growing sales of "Double Diamonds" required the addition of 60% more manufacturing space. Hence, we now enter the more promising future with better and more facilities to serve as your "gear department" or to fill your gear orders with "Double Diamond" Gears that are built *to produce low installed cost . . . to serve economically and dependably on the job for which you buy them . . . and to do credit to your product and your reputation.*



May we send you this catalog of the gear types in which we specialize: helical gears, flywheel starter gears, straight bevel gears, straight spur gears, angular bevel gears, hypoid bevel gears, gear assemblies, zerol* bevel gears, spiral bevel gears, and spline shafts?

*Reg. U. S. Pat. Off.

EATON

AUTOMOTIVE GEAR DIVISION
MANUFACTURING COMPANY
RICHMOND, INDIANA

GEARS FOR AUTOMOTIVE, FARM EQUIPMENT AND GENERAL INDUSTRIAL APPLICATIONS
GEAR-MAKERS TO LEADING MANUFACTURERS

This Week in STEEL

The Metalworking Weekly

September 7, 1959 Vol. 145—No. 10

Metalworking Outlook, Page 35

The Editor's Views—Will You Be Late? 41
▶ Most Partmakers Won't Be Hurt by Strike Until After Oct. 1 43
Strike Losses: $562,000,000 in Wages, $1,638,000,000 in Sales.. 44
Steel Companies Still Operating—List brought up to date ... 45
▶ Look Where Plastic Tooling Is Going—Up 500 per cent by 1969? 46
Communication Aids Labor Relations—Firms evaluate media .. 48
Second of three-part STEEL series on how to deal with employees
Foreign Investments Rise—Total reaches $40.8 billion 51
▶ Testing & Inspection Equipment Orders Will Accelerate 55
No. 9 in STEEL series on metalworking's capital equipment spending
▶ Turnaround for Urban Transit?—Equipment market may boom 58
Railroad Bearingmakers Up Plant Capacities—Two firms expand 74

Technical Outlook, Page 87

Tape Puts Jig Borers on Production Line—Mistakes avoided.. 88
▶ Drives Get Smaller, Carry Bigger Loads—Space utilized better 90
▶ Material Switch Trims Parts Costs—Another cost crisis article 92
Heliarc Offers Better Way to Cut Stainless Steels 93
Machine Topics—39 Valves Broached as Fast as One Old Way 94
Progress in Steelmaking — Strip Tension Control Reduces Breakage 96
Automatic Heat Treatment Hardens Stainless Knives 98
Electrolytic Method Promises Cheaper, Purer Titanium 100
Automatic Die Lubrication Improves Forging Quality 101
What Extruded Beryllium Offers—Producer cites advantages .. 102

Market Outlook, Page 111

Complete Index to Market News and Prices 111
▶ Titanium Maker Changes to Civvies—Mallory-Sharon starts drive 113
Steelworks Operation Chart and District Ingot Rates 121
New Strength Develops in Scrap—Composite up 67 cents a ton 133
Nonferrous Metals—Copper, Zinc Prices Move 136
Strike's Impact on Scrap Use Less than Expected 140

▶ Articles listed on cover.

WHERE TO FIND

Metalworking Pulse ..Turn page
STEEL Servicenter 5
Calendar of Meetings 10
Editorial & Business Staffs 16
Windows of Washington. 52
Mirrors of Motordom 61
The Business Trend 65
Men of Industry 69
Obituaries 72
New Products 105
New Literature 109
Advertising Index 141

Index available semiannually.

STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Metalworking Pulse ▶

TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED AUG. 29	PREVIOUS WEEK	MONTH AGO	YEAR AGO
(1947-49=100) Based on steel output, electric power output, freight carloadings, auto assemblies.	110† †Preliminary.	112	121	132

With the exception of the Labor Day week, STEEL's industrial production index has just about hit its low point for the year. Startup of new model auto production will push the trend line up, but don't expect any startling rise until the steel strike is settled.

Details on Page 62

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED SEPT. 5	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled ..... (Source: Ward's Automotive Reports.)	15,000* *Estimated.	18,396† †Preliminary.	108,240	12,016

Motordom is caught in the lull between old and new models, but it won't last long. The only cars being produced now are a few 1960s, but by mid-September, you can expect hurried activity from all makers.

Details on Page 65

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED SEPT. 6	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands)	340*	332	318	1,666
Index (1947-49=100)	21.2*	20.7	19.8	103.7
Percentage of capacity	12.0*	11.7	11.2	61.7

*Estimated by STEEL; comparative figures reported by AISI.

No significant change in steel ingot output is expected for the duration of the strike. As current contracts expire, most are being extended on the basis of a Big Steel settlement plus 30 days and retroactive provisions.

Details on Page 121

STEEL SCRAP PRICE COMPOSITE

	SEPT. 2	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$39.00	$38.33	$38.33	$42.67

An advance in prices obtained on auto lists sparked an upward revision in steelmaking grades last week. STEEL's composite on No. 1 heavy melting advanced 67 cents a ton to the highest level since the end of March.

Details on Page 133

FINISHED STEEL PRICE INDEX

	SEPT. 1	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.7	186.7	186.7	186.5

Price stability is being maintained in the domestic steel market. Mills, of course, will take no action until the labor question is answered. Although demand would support higher distributors' prices, this market also is firm.

Details on Page 122

You fill out the coupon

PUBLICATIONS DEPARTMENT
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

Please send me a copy of your completely revised booklet, "HIGH-STRENGTH BOLTING FOR STRUCTURAL JOINTS."

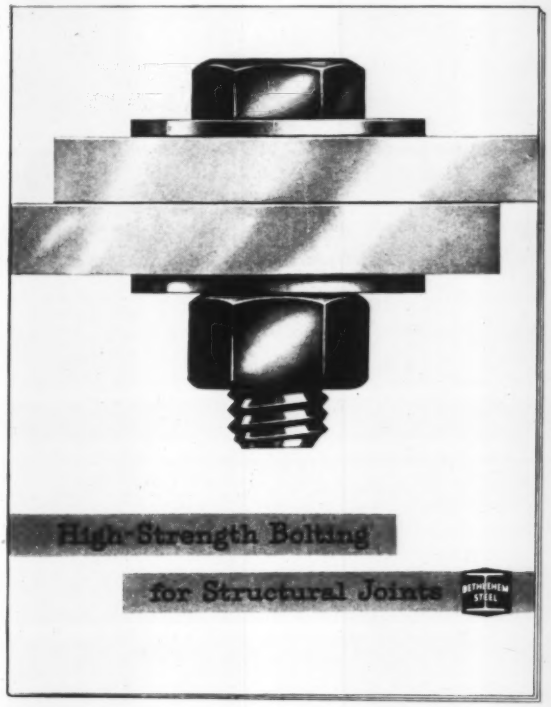
☐ *Also send me Bulletin #35 describing "Turn-of-nut" torquing method.*

Name_____

Company_____

Street_____

City_____ Zone_____ State_____



We'll send you this booklet

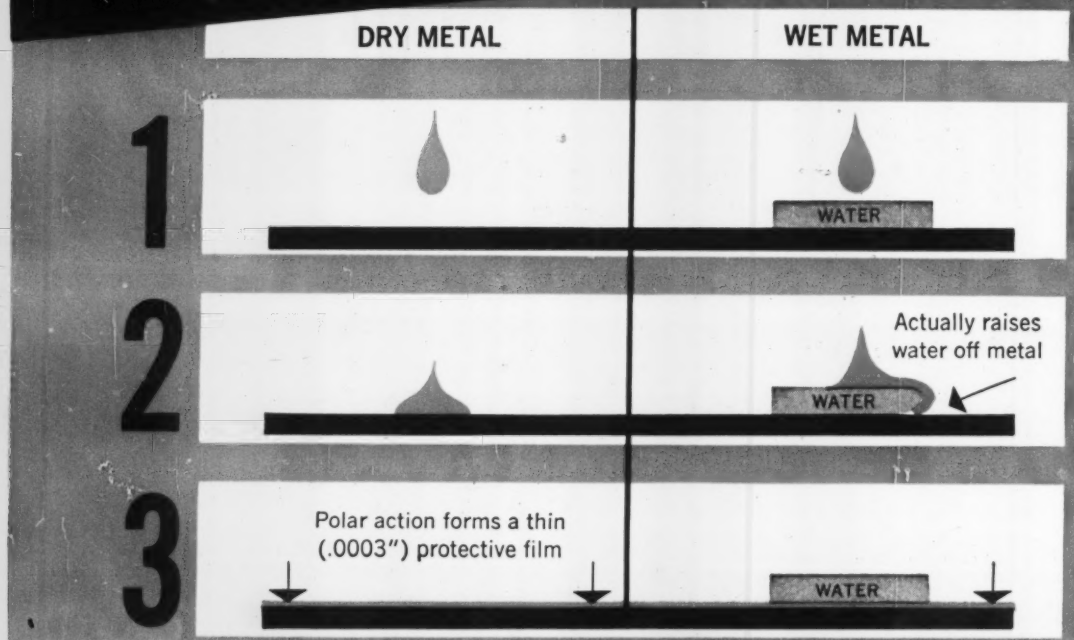
NEW EDITION OF AN OLD FAVORITE. 20 pages of the kind of information you want: torquing methods, dimensional standards, specifications for materials and assembly, and other data. 32 illustrations. Also available: Bulletin #35 giving full details on how to torque using "Turn-of-nut" method.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

How *polarized* RUST VETO 377 protects metal... DRY or WET



If metal parts are wet, polarized Rust Veto 377 actually raises water off metal to form a long-lasting protective film under the moisture.

Now, metals don't have to be dry to be protected against corrosion by a fast, economical coat of multi-purpose Rust Veto 377 . . . your best long-term protection for tools, dies, bearings, machines and parts stored indoors or packaged. Its tough, thin .0003" film is practically invisible.

Rust Veto 377 literally displaces moisture and clings to the metal. It resists oxidation with no deterioration of the protective film for as long as a year. It can be used effectively, without staining, on all types of metal and you don't have to remove it except when parts are to be painted or plated.

COSMOLINE / RUST VETO

Most famous names in rust prevention

...products of

For full details about Rust Veto 377 send for NEW ILLUSTRATED BULLETIN; or for help on any industrial rust prevention problem, call or write: E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

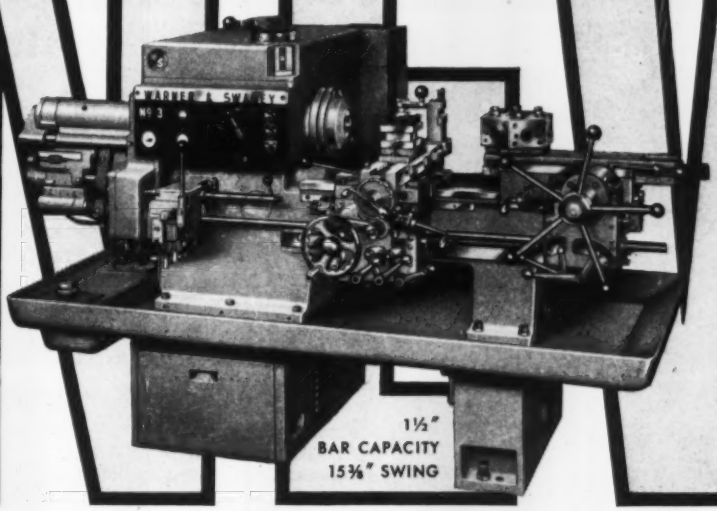
When preserving for military use specify **COSMOLINE 377** (Conforms to MIL-C-14201A, Grade 2)

E. F. HOUGHTON & CO.

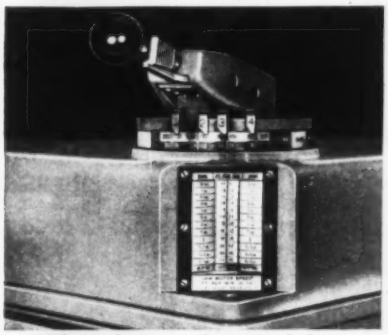
Ready to give you on-the-job service

Philadelphia, Pa. • Chicago, Ill. • Carrollton, Ga. Detroit, Mich. • San Francisco, Calif. • Toronto, Canada

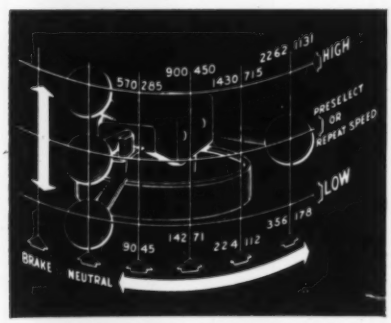
NEW



WARNER & SWASEY No. 3 ram type turret lathe



This is the new exclusive single lever headstock control...



This is how easy it is to operate

Unique, Automatic Headstock

More Speeds—Greater Range—The new eight-speed headstock (16 with a two-speed motor) gives you more speeds in a wider range—from 45 to 2262 rpm—for maximum metal removal efficiency.

Instant Speed Changes are made possible through exclusive, Warner & Swasey designed direct-acting hydraulic clutches (which never need adjustment) in combination with a constant mesh, helical gear train.

Full Power is always available at the spindle nose. Higher-powered motor is direct-mounted to eliminate drive maintenance problems.

Exclusive, Single Lever Preselector and Speed Control

On the new No. 3, preselection of speeds, speed change, brake and neutral are all obtained with the same lever.

No fumbling for speeds... no gear shifting. Just rotate the handle to preselect; move it up or down to engage new speed instantly.

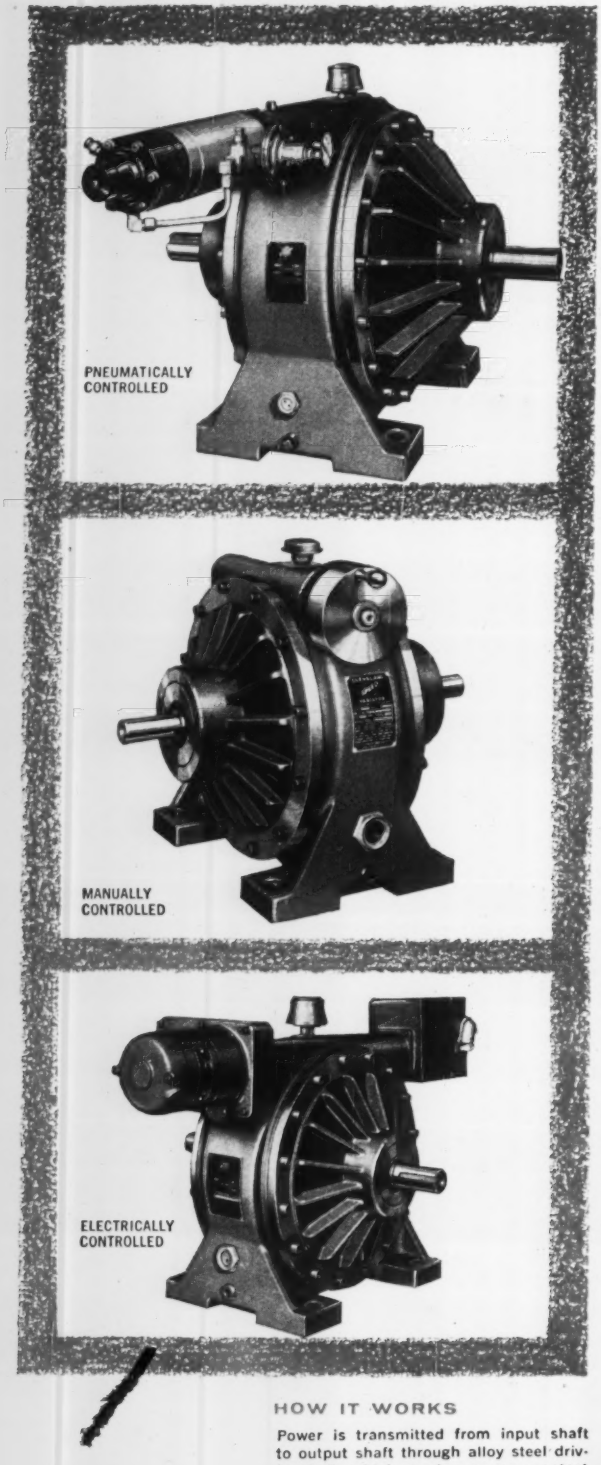
No figuring... the direct reading preselector dial tells you the surface speed for each diameter and rpm.

No remembering (or forgetting)... the preselector drum lets you set up the sequence of cuts; numbered clips tell you where to find the speeds and their order of use.

Neutral (free spindle) and Brake are selected by rotating lever to the left.

Warner & Swasey Co.
Cleveland 3, Ohio

You can produce it better, faster, for less...with a WARNER & SWASEY



with Cleveland Speed Variators... precision control is a simple matter

Cleveland Speed Variators — mechanical traction-type variable drives with stepless speed control — provide both increase and decrease of output speed on a range up to 9:1 from a constant speed power source.

Infinitely variable speed regulation is provided with instant, smooth change by either manual, automatic, or remote control. Precise adjustments are easily made with accurate adherence to settings. Some typical examples:

For the Chemical Industry
In rubber processing seventeen variators provide necessary process flexibility when changing production from one type synthetic rubber to another.

For the Automotive Industry
Variators give accurate control of assembly line speeds to control conveyor output rates.

For the Tobacco Industry
Variators make delicate adjustments for electronic beta gage controller.

For the Steel Industry
Variators provide remote control speed change on processing line conveyor.

For the Metal Working Industry
Variators permit fast, accurate adjustment of machining speeds for metals, from magnesium to 38 Rc steel.

For the Wire Products Industry
Variators control four reels simultaneously — and without slippage.

In Ore Processing
Variators easily adjust rate of material feed to hammermill.

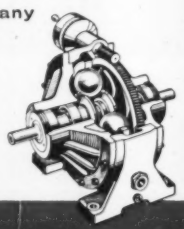
In Material Handling
Variators control movement of steel tubes through 176-roll annealing furnace.

The Cleveland Worm & Gear Company
Speed Variator Division
3270 East 80th Street, Cleveland 4, Ohio

A subsidiary of
Eaton Manufacturing Company

Sales representatives in all major industrial markets.

Send for your free copy of Bulletin K-250. It gives the complete Variator control story.



CLEVELAND SPEED VARIATOR

HOW IT WORKS

Power is transmitted from input shaft to output shaft through alloy steel driving balls which are in pressure contact with discs attached to the two shafts. Relative speeds of the shafts are adjusted by changing the positioning of the axles on which the balls rotate (see cutaway view, right).

Asks About Spending

"In your articles on industries spending for capital equipment, what do you mean by spending?" asks R. C. Nethercut, market research, Barber - Colman Co., Rockford, Ill. "Are you referring to appropriations by companies, order placement, or actual payment for equipment, which may occur around a month after the equipment is received?"

STEEL's editors designed the survey of capital equipment spending to reflect actual ordering plans. We feel that appropriations fail to be good indicators since companies may not use all of the money appropriated. Of course, actual payment for equipment is no indicator of future purchasing trends.

This issue contains an article on the spending outlook for testing and inspection equipment and information on foundry spending will be in the Sept. 14 issue.

The editors will conduct this survey semiannually. Our next series will start in January, 1960. We're looking for ways to make the survey more useful. If you have suggestions, we'll appreciate your dropping us a note.

'Bombs Awa . . . Oops!'

Associate Managing Editor Vance Bell uncovered this news release one cheerful morning: "A unique selector valve gives the commander of a crippled aircraft complete control over the sequence in which crew members are ejected from the aircraft. The commander can be sure that ejected crewmen will not collide in midair, or be ejected when they might collide with the aircraft . . ."

Vance immediately envisioned the valuable valve doing away with the situation confronting overly polite flyers, who, though in danger, would say: "After you, Gaston."

We passed the release around to STEEL staffers, and here are some selected comments: Bill Olds pictured an instructor talking with a new pilot: "Now familiarize yourself with the controls, knobs, and levers by handling themmmmm . . ."

Neil Roberts could see uses for the unit in committee work. The chairman has his hand on the switch and says: "Now if we all agree, let's take a vote."

John Teresko cogitates about the pilot, in the dim recesses of the cockpit, saying: "Davis, I'm pushing your intercom button, why don't you answer? Davis? Davis?"

Who's Hurting?

G. W. Hill, president, Service Spring Co., Indianapolis, writes: "Page 78 of your Aug. 10 issue shows lost steelworker wages, $270,800,000, and lost sales, $798,000,000, through the tenth.

"Those figures, if shown to a striker, would encourage him to continue striking with the belief that the industry is 'hurting' three times as much as the worker.

"Such a presentation tends to prolong the strike. If a figure of $7 million or $8 million profits lost during the period were shown, it would be far overshadowed by the $270,800,000 losses in wages."

We considered and gave up that idea, Mr. Hill. It would be extremely difficult to determine the amount of average profits lost. The editors are considering the idea again, however, and if a suitable method can be found, we'll start making the comparison.

Nose for Booze

A fellow called Bob Huber, our machine tool editor, the other day and said in a pronounced British accent: "Chappie, I don't really know if I should be phoning you up about metalworking or if I should just pop over and quaff a few 'arf 'n' 'arfs."

It seems the gent had looked up STEEL in Cleveland's phone directory and found this:

Steel a pub 1213 W 3 .....MAin 1-8260.

Notes from the Forge

Robert H. Masterson, staff representative, Drop Forging Association, Cleveland, writes: "Page 79 of your Aug. 3 issue contains an article entitled 'Hardfacing Trims Die Cost $12,000.' I am sure our members would be interested in the kind of forging equipment on which these dies were used. Hammers or presses? Also, by what percentage was production increased through the use of hard faced dies?"

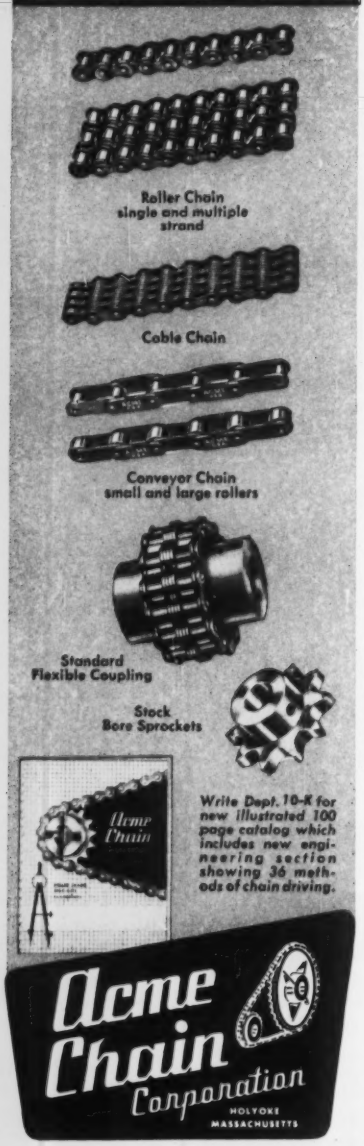
Both hammer and press dies, where major wear occurs on the flash line, make good use of the nickel base alloy. In the instance cited, a gravity drop hammer was used in the forging. As to

No Costly Delay when YOU *specify* ACME CHAIN

PROMPT DELIVERY in all sizes on

ACME

CHAINS — SPROCKETS COUPLINGS IN ANY QUANTITY FROM YOUR DISTRIBUTOR


Roller Chain
single and multiple strand
Cable Chain
Conveyor Chain
small and large rollers
Standard Flexible Coupling
Stock Bore Sprockets
Write Dept. 10-K for new illustrated 100 page catalog which includes new engineering section showing 36 methods of chain driving.
Acme Chain
Corporation
HOLYOKE MASSACHUSETTS

production percentage increases, many companies are chary about disclosing them, but we know that the production increase average was 338 forgings per machine per shift. Further information is available from the alloymakers, Haynes Stellite Co., a division of Union Carbide Corp., New York.

Fractured Latin

Remember how we talked about our Honorary Editor cards in the Aug. 3 Servicenter? We mentioned that Miss Elizabeth Walker, associate dean of Mather College, Western Reserve University, had put the final O.K. on the phrase *res metallicas*, which appears on the back of each card.

J. F. Miller, plant engineer, Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., Claymont, Del., writes: "Here's one for Dean Walker. How about changing the Latin phrase to: '*res les metalli cuss*.' You would get this sooner or later anyway, no doubt."

Getting the Marketers' Views

When researching stories, STEEL's editors usually can interview one executive in a company and obtain a fairly complete picture of the firm's activities.

Bill Dean, Chicago editor, found that in building a marketing story, firms requested that he talk with two or more executives. In the above picture, he's shown with his notebook at the ready interviewing three at Acme Steel Co.: (l to r) James E. Borendame, director of marketing services; G. Findley Griffiths, executive vice president; and Joseph H. Myers, vice president-marketing.

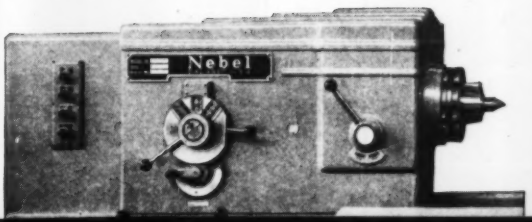
Why so many people? Teamwork has become marketing's standard. Modern marketing involves more than charting sales projections drawn from results of "nose counting" surveys. To a degree, effective marketing requires the efforts of everyone in a company.

Bill learned that many makers of industrial products have lagged behind their consumer counterparts in adopting the integrated marketing concept. Aggressive metalworking firms are catching up and in our Program for Management article next week, Bill will tell you how they're doing it.

NEBEL HEAVY DUTY LATHES

entirely new . . . proven design . . .

Now, NEBEL offers you *heavy duty* precision machining in a completely new, proven design line of lathes . . . yet maintaining the substantial economies for which Nebel is famous. Choose from a complete selection of ruggedly designed, fully field-tested extension bed gap and engine lathes, with more and higher spindle speeds than ever before available from Nebel. All are manufactured to the complete A.S.A. standards and tolerances for engine lathes. Write for new bulletin.



NEBEL LATHE DIVISION
NEBEL MACHINE TOOL CORP.
3405 Central Parkway, Cincinnati 25, Ohio

Republic High-Performance Titanium for the F-105

NEWEST ADDITION TO TAC— the F-105 fighter bomber —is made by the Republic Aviation Corporation, Farmingdale, Long Island, N.Y. Unique clover-leaf speed brake brings the Thunderchief from Mach 2 to subsonic speeds quickly and with no appreciable loss of stability. Alloy grades of Republic Titanium used must withstand 700-degree temperatures and pressures up to 90,000 psi.

In Republic Aviation's F-105—the world's fastest fighter-bomber—mission requirements dictated a high-performance speed brake capable of bringing the plane from Mach 2 to subsonic speeds quickly and with no appreciable loss of stability.

Working closely with design engineers, Republic Steel supplied the titanium for the 360-degree clover-leaf speed brake. Hot formed, the titanium "petals" are designed to withstand searing 700-degree temperatures and the 90,000 psi impact accompanying brake extension at Mach 2.

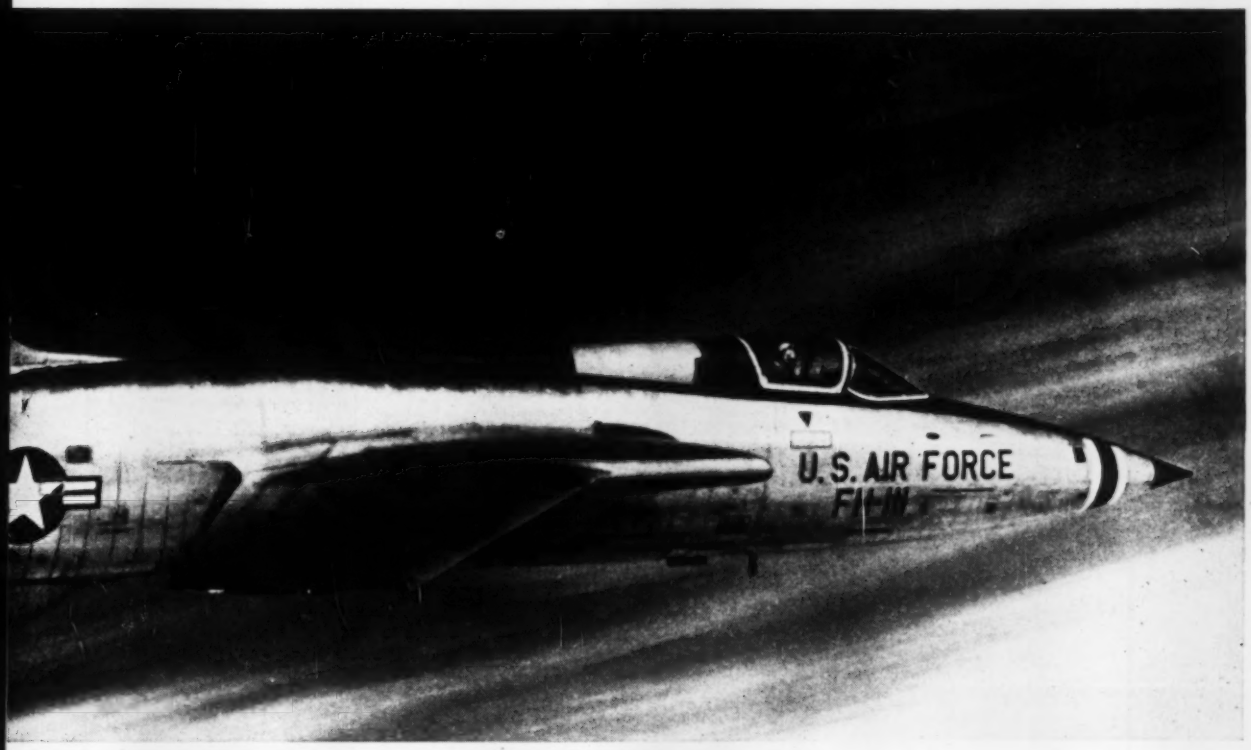
Look to Republic Steel for new developments in metals to increase strength, resist heat, trim weight. Constantly expanding research, production, and service facilities have made Republic Steel the nation's largest producer of *high-performance* metals—titanium, stainless, and alloy steels.

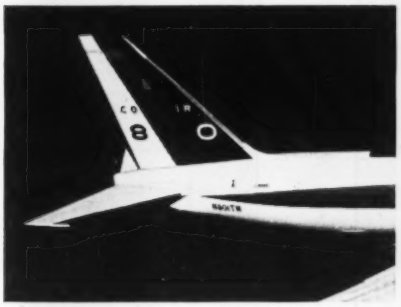
Let us help you find the most advantageous uses for these metals in *your* project. Return the coupon for complete information without obligation. Indicate if you would like a metallurgical specialist to call.

REPUBLIC

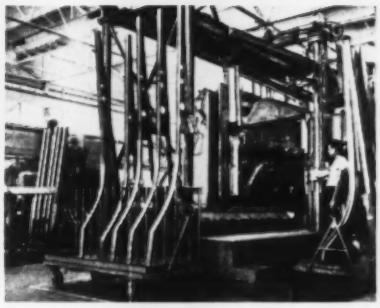
REPUBLIC STEEL

World's Widest Range of Standard Steels





REPUBLIC STAINLESS STEEL is used in leading edges of the Convair 880's vertical fin and horizontal stabilizer where anti-icing is accomplished through electrical heating of the metal. Use of Republic ENDURO® Stainless Steel increases strength and heat resistance, permits thinner, lighter gages. Types 301 and 302 are readily formed into desired shapes by cold-forming, drawing, and bending operations.



REPUBLIC ALLOY STEEL—Type AMS 6428—is currently being used by Rohr Aircraft Corporation in the manufacture of flap track weldments for a major Air Force bomber program. This fine steel provides a minimum tensile strength of 180,000 psi in the heat-treated condition. Also used at 220,000 psi minimum tensile strength for other applications. Return the coupon for information.

REPUBLIC'S NEW HIGH-STRENGTH POWDER, TYPE HS6460,

is ideal for sinterings of highly stressed components. Provides minimum tensile strength of 60,000 psi at 6.4 density as sintered . . . 100,000 psi after heat treatment. Maximum of .004% shrinkage from die size at 6.4 density. Available in quantities up to and including 12 tons or multiples. Can be used with existing operating equipment. Mail coupon for technical data sheet.

REPUBLIC STEEL CORPORATION
DEPT. ST -7819
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Have a metallurgist call:	Send more information on:
☐ Titanium	☐ Titanium
☐ Alloy Steel	☐ Alloy Steel
☐ Republic Stainless Steel	☐ Republic Stainless Steel
☐ Type HS6460 Metal Powder	☐ Type HS6460 Metal Powder

Name_____ Title_____

Company_____

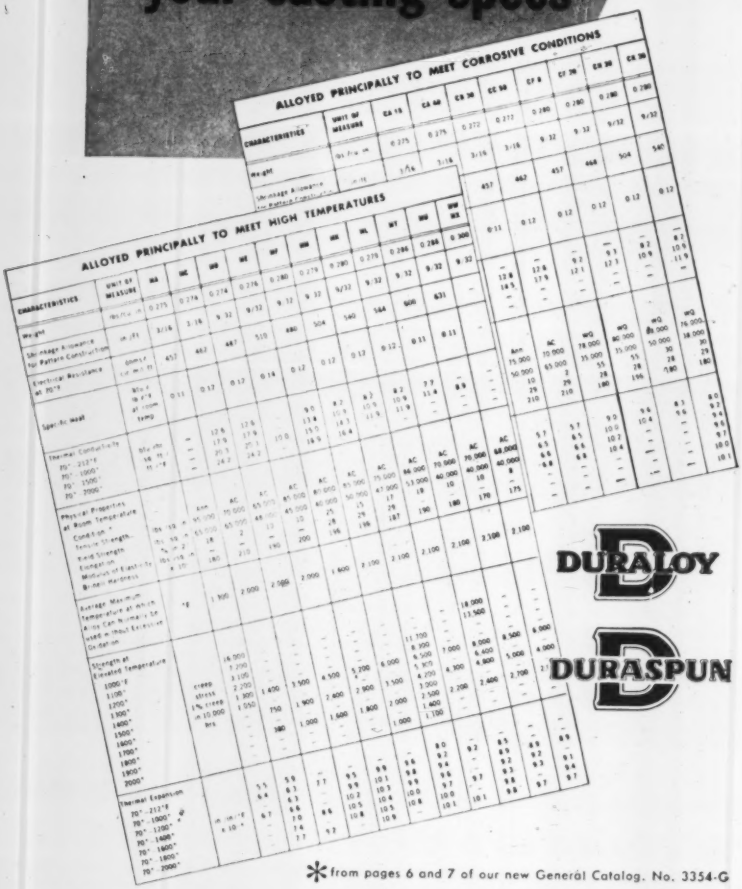
Address_____

City_____ Zone____ State_____

STEEL

and Steel Products

TABLES to help you select the proper alloy for your casting specs



DURALOY

DURASPUN

*from pages 6 and 7 of our new General Catalog. No. 3354-G

— and there's lots more useful information about high alloy castings in our up-to-date catalog describing Duraloy Service. SEND FOR YOUR COPY.

As one of the pioneers in both static (1922) and centrifugal (1931) high alloy castings, we have a wealth of experience to focus on your high alloy casting problem. Send for our catalog, study it, and then let us help you get the best alloying combination to solve your corrosion, high temperature and/or abrasion problem.

The DURALOY Company

OFFICE AND PLANT: Scottdale, Pa.

EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
ATLANTA OFFICE: 76—4th Street, N.W.
CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

CALENDAR OF MEETINGS

Sept. 13-17, Pressed Metal Institute: Annual meeting, Stanley Hotel, Estes Park, Colo. Institute's address: 3673 Lee Rd., Cleveland 20, Ohio. Managing director: Harold A. Daschner.

Sept. 13-18, American Chemical Society: Fall meeting, Convention Hall, Atlantic City, N. J. Society's address: 1155 16th St. N.W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 14-17, American Mining Congress: Metal mining and industrial minerals convention, Denver. Congress' address: Ring Bldg., Washington 6, D. C. Executive vice president: Julian D. Conover.

Sept. 14-17, Society of Automotive Engineers: National farm, construction and industrial machinery meeting, production forum, and display, Milwaukee Auditorium, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 16-17, American Die Casting Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

Sept. 16-18, National Industrial Conference Board: Marketing conference, Waldorf-Astoria Hotel, New York. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

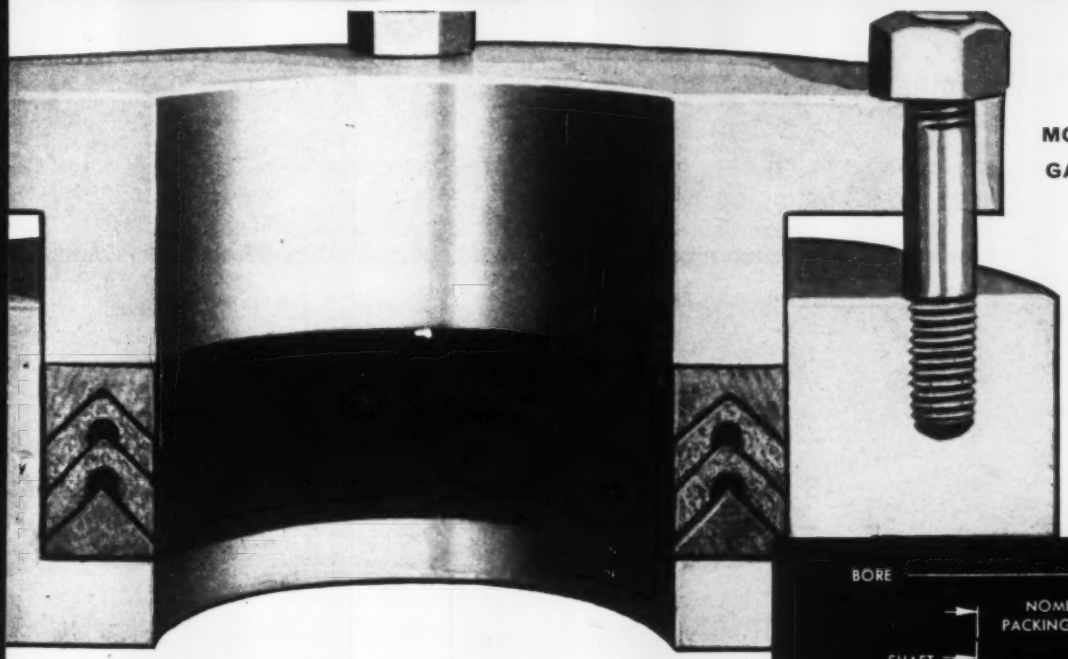
Sept. 17-18, American Society of Mechanical Engineers: Engineering management conference, Statler-Hilton Hotel, Los Angeles. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: O. B. Schier.

Sept. 18, Malleable Founders' Society: Industry meeting, Hotel Sheraton-Cleveland, Cleveland. Society's address: 781 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

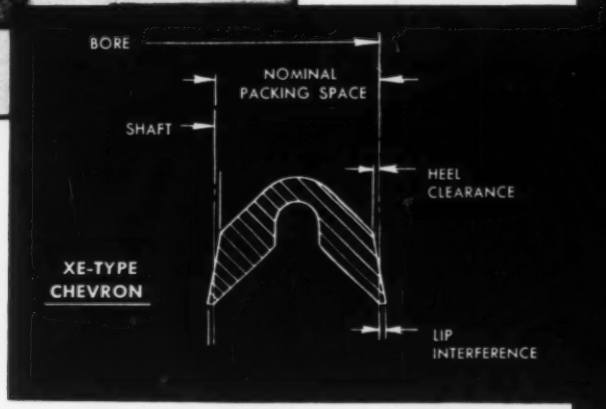
Sept. 21-22, Steel Founders' Society of America: Fall meeting, Homestead Hotel, Hot Springs, Va. Society's address: 606 Terminal Tower, Cleveland 13, Ohio. Executive vice president: F. Kermit Donaldson.

Sept. 21-23, American Management Association: Personnel conference, Astor Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y.

Sept. 21-25, Instrument-Automation Conference & Exhibit: International Amphitheatre, Chicago. Sponsor: Instrument Society of America, 313 Sixth St., Pittsburgh 22, Pa. Executive director: William H. Kushnick.



MORE ABOUT THE GARLOCK 2,000



HOW LIP INTERFERENCE AND HEEL CLEARANCE IMPROVE CHEVRON* PACKING DESIGN

There are many reasons why users prefer famous Garlock CHEVRON Packings for sealing rams or rods on hydraulic systems. Design refinements indicated in the drawing above are just two examples:

Heel clearance for easy installation. Experience has shown that unless adequate clearance is provided at the heel of a V-type packing ring it can be very difficult to insert in the stuffing box. The heel clearance on Garlock CHEVRON Rings has proved to be the ideal for easy installation without disturbing the unique advantages of the CHEVRON design.

Lip interference for sealing at low pressures. If the lip of a V-type packing is made exactly to nominal size, and all the clearance taken at the heel, leakage past the lip often occurs at low or zero pressures. On the other hand, too much interference at the lip generates excessive friction resulting in scoring and wear. The lip interference on Garlock CHEVRON Packing is your assurance of minimum friction and positive sealing at all pressures.

There are many other design advantages of Garlock CHEVRON including its hinge-like construction which automatically compensates for pressure changes. If you have a sealing problem involving lubricants, liquids, or solvents at temperatures ranging from −320°F to +600°F, why not find out more about the many forms of Garlock CHEVRON Packings available.

CHEVRON Packings are another important part of the Garlock 2,000 . . . two thousand different styles of packings, gaskets, and seals for all your needs. Call your local Garlock representative or write for Folder AD-115.

*Registered Trade Mark

THE GARLOCK PACKING COMPANY, Palmyra, N. Y.

For Prompt Service, contact one of our 26 sales offices and warehouses throughout the U. S. and Canada.

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Molded and Extruded Rubber, Plastic Products

Canadian Division: The Garlock Packing Co. of Canada Ltd.
Plastics Division: United States Gasket Company

Lubrication

NEW GREASE WITH EP PROPERTIES TAKES 700°F TEMPERATURES

In three years of field testing, a unique new grease called Thermatex EP 1 has:

—lubricated plain bearings operating at 700°F.

—regularly withstood steam pressures of 125 psi at 300-325°F for 20 hour periods.

—effectively lubricated equipment handling corrosive chemicals.

—resisted coking and solidifying in steam joints where temperatures reach 400°F.

Advantage lies in unique combination of properties

Users agree that the major benefit of Thermatex lies in its unique combination of extreme pressure properties with high heat resistance. While several greases now on the market have one property or the other, Thermatex is believed to be the first which effectively combines both.

Maintenance savings stressed

The use of Thermatex has already helped slash maintenance costs in a surprisingly wide number of applications. To indicate its potentialities —here's what happened when it was used in the steam joints of a paper drier machine: The previous grease used by a West Coast paper manufacturer would invariably solidify and coke in the last few feet of its supply line under the 400° heat. These failures occurred as often as every two weeks.

Three years ago, Texaco persuaded the manufacturer to give the experimental grease a trial. Since then, according to the user, no lubrication failures whatever have occurred, and no evidence of coking or plugging has been recorded.

Capabilities and limits

Information now available shows that Thermatex EP 1 will lubricate satisfactorily at 450-500°F when relubrication occurs every 3 or 4 days. It will provide adequate protection at 550°F with more frequent lubrication periods. Over this figure, the grease's useful lubricant life is measured in hours, but a centralized pressure system can still insure completely adequate lubrication.

For complete information and test results, check the coupon.

Oil mist lubrication gaining wide acceptance

Lubrication by means of an oil mist or fog is rapidly proving its advantages in many types of industrial machines. According to plant engineers, use of oil mist can provide a relatively inexpensive, truly centralized lubrication system.

How it works

In this type of system the oil is atomized into extremely fine particles—less than 2 microns in diameter. The resulting fog can be carried long distances through straight pipes and around bends without any appreciable condensation. The oil condenses only on fast moving parts —where it is needed. On slower moving parts reclassification fittings are used to produce either spray or droplets.

Advantages are significant

Proponents of oil mist lubrication cite a number of advantages the system has over conventional lubricating methods. They include the following:

Use of oil mist eliminates the danger of drippage which might contaminate the material being processed. Points which are hard-to-get-at or in dangerous locations can be lubricated from one convenient spot.

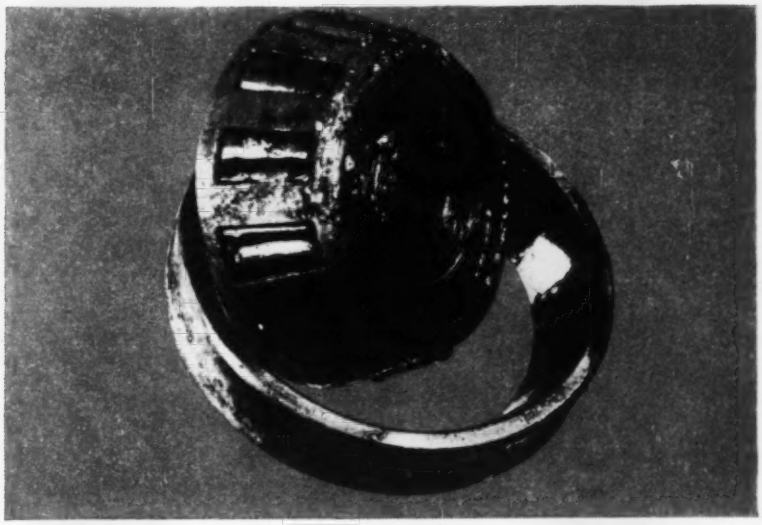
Positive air pressure in the system tends to check the entrance of contaminants such as water, dirt and abrasives—while the air itself provides some cooling effect.

Choice of oil is important

Experts offer a word of caution when it comes to selection of the oil. To be avoided are oils containing graphite, latex, insoluble soaps, fillers or other solids. Best choice seems to be an oil with viscosity at 100°F. (SU) of not over 1,000 seconds.

Texaco products tested and recommended for oil mist applications include Regal Oil PC R&O, Regal Oil C R&O and Meropa Lubricant 1. Test results for these and other recommended Texaco oils are available. Check coupon at right.

news



The difference between Fe_2O_3 and $Fe_2O_3H_2O$ exonerated the lubricant in this bearing failure.

Deposit analysis can uncover surprising reasons for failure

When equipment fails, industry's natural tendency is to blame the lubricant. For this reason, samples of oils and greases—often no more than mere specks—sections of failed gears, bearings, and other ruined pieces of equipment are analyzed at the Texaco Research Center, Beacon, N. Y. Here they are subjected to a searching analysis by technical service experts using a tremendous variety of apparatus and procedures.

Lubricant is seldom guilty

Of the numerous samples submitted every year, the lubricant is guilty in less than 1% of the cases. Take a typical example:

A customer submitted the roller bearing illustrated above. The bearing and its lubricant were liberally contaminated with both red and black material. X-ray diffraction analysis disclosed that the contaminant was an alpha ferric oxide which is characteristic of fretting corrosion—usually correctable only by a design change. Had ordinary rusting occurred the contaminant would have been hydrated ferric oxide—and a finger could have been pointed at the lubricant for allowing water to come in contact with the bearing.

The March, 1958, issue of Lubrication Magazine contains a fascinating series of these "detective" stories. Write for your copy; the supply is limited.

Explains Significance of Lube Tests

The October issue of Lubrication Magazine is designed to give the lubricant user new insight into the significance of lubricant tests. The article demonstrates how the tests —which determine some lubricant properties—can help the lubrication engineer in selection of lubricants for specific equipment. Check the coupon for your free copy.

NEW PRODUCT NEWS

Chemical grinding coolant leaves no oily film—keeps machines cleaner. Helps prevent heat check, permits the use of a finer grit wheel—*Cooltex.*

Selection of cutting or grinding fluids can be critical production problem

Which is best—a straight cutting oil, a soluble oil emulsion, or a chemical coolant? Picking the right type is often a difficult problem, yet the correct choice can often yield major production savings, according to Texaco's chief Metalworking Engineer.

Multitude of factors complicate job

It is pointed out that there is no "best" type of fluid—it all depends on the type of operation. Some cutting jobs, for example, can get by with just a coolant, others—such as automatic screw machines—need a fluid that can lubricate as well as cool, because of inevitable leakage between sumps. Physical properties of the work, high heat—even hard water—can also affect the choice.

Grinding: New chemical coolant adds to choice

Chemical coolants—like Texaco's Cooltex, for example, are comparative newcomers to the grinding operation. However, many operators can point to production boosts of over 200% by using Cooltex instead of an oil. But again it all depends on the particular problems of the operation.

Expert advice can save money

Also underlined is the fact that calling in an expert to discuss cutting oil requirements can pay off for a great many manufacturers. Texaco, for example, maintains a staff of Metalworking Lubricant Engineers from coast to coast, whose prime function is consultation on cutting oil problems.

TEXACO INC., 135 East 42nd Street, New York 17, N. Y., Dept. S-LN-30

Dear Sirs:
Please send me more information on

- ☐ Thermatex
- ☐ Cooltex
- ☐ Recommendations for oil mist lubricants
- ☐ Please send the October issue of Lubrication Magazine

Name_____

Firm_____

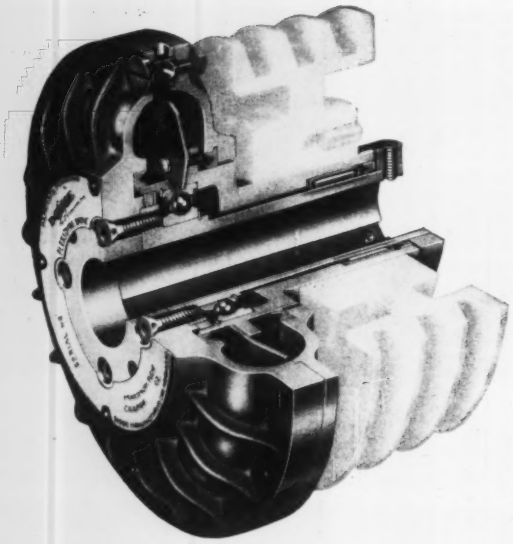
Address_____

City_____

Zone_____ State_____

WHAT'S YOUR PROBLEM?...

- ☑ Overheated motors?
- ☑ Excessive belt maintenance?
- ☑ Breakage of materials being processed —like thread, wire, paper?
- ☑ Expense of oversize or high torque motors?
- ☑ High demand rate?
- ☑ Expense of reduced voltage starters?
- ☑ Clutch trouble?
- ☑ Breakage of transmission parts due to instantaneous shock loads?
- ☑ Damage and recurring down-time from overloads?



FLEXIDYNE

THE DRY FLUID DRIVE

It is no longer necessary to accept the destructiveness—the costliness—of conventional starting in the mechanical transmission of power. Flexidyne changes that!

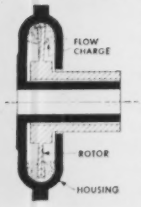
Flexidyne is the new way to start loads *smoothly*—to protect against shock and overload—to save power—all *without any sacrifice of efficiency at full load!*

This revolutionary development is ushering in "the day of the soft start"—which can mean thousands of dollars to you in equipment savings and in better, more economical operation.

Flexidyne is available, off the shelf, in Drives and Couplings. Capacities range from fractional to 1,000 hp. Ask your local Dodge Distributor or write us for technical bulletin.

DODGE MANUFACTURING CORPORATION, 4400 Union St., Mishawaka, Ind.

HOW FLEXIDYNE WORKS



The "dry fluid" in Flexidyne is tiny heat-treated steel shot. A measured amount, called the "flow charge," is contained in the housing, which is keyed to the motor shaft. Inside the housing is a rotor, free to revolve relative to the housing, but connected to the load.

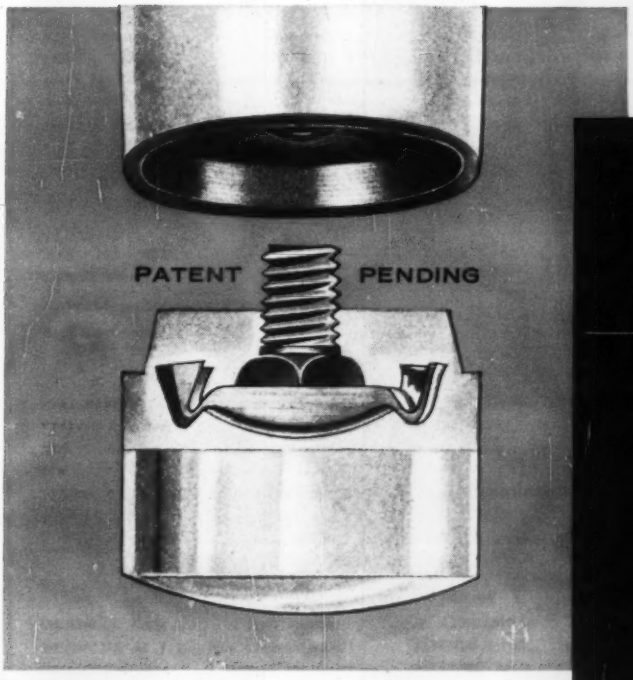
When the motor is started, centrifugal force throws the flow charge to the perimeter of the housing, packing it between the housing and the rotor, which transmits power to the load. Initial slippage is momentary. Housing and rotor become locked together and achieve full load speed without slip and at 100% efficiency.

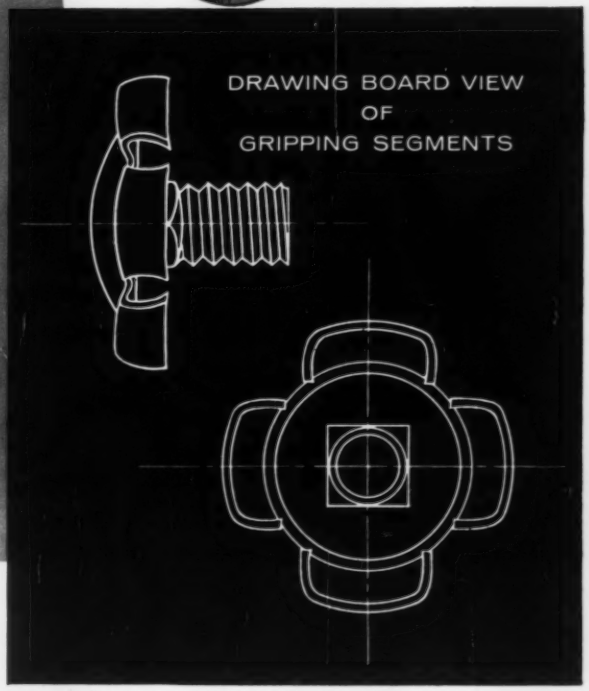
CALL THE TRANSMISSIONEER — your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

DODGE

of Mishawaka, Ind.

It won't budge...





"Stub'n"...

an innovation by Nicholson Engineers

"Stub'n" is an entirely new type of torque holder for soft face industrial hammers—designed by Nicholson engineers in the same laboratories which create the world's finest file making machinery. It features a new shock plate design that readily dissipates shock and percussion waves and distributes the striking force equally throughout the face. Divided into four segments, each one of which "freezes" into the head of the hammer, "Stub'n" cannot twist or wrench under the most violent blows. Far superior to any other type holder—and exclusively Nicholson. Try this new principle in soft face hammers and feel the difference—it will meet the most exacting test. Contact your industrial distributor now! ✻ ***Industrial Distributors provide the finest goods and services in the least possible time. Our products are sold exclusively through them.***

NICHOLSON U.S.A.

NICHOLSON FILE COMPANY
PROVIDENCE 1, RHODE ISLAND

RAIL and TRACK ACCESSORIES

Get the advantage of "single-source" buying for all your needs in industrial track and crane runways. Prompt deliveries assured from the nation's largest warehouse stocks of rail, switch material, tools and construction products. Foster is national distributor to industry for major manufacturers, such as Weir-Kilby, Woodings-Verona, Nolan, Western Industries and others.

Refer to our catalogs in Sweet's File

L.B. FOSTER CO.
PITTSBURGH 30 NEW YORK 7 CHICAGO 4
HOUSTON 2 LOS ANGELES 5 ATLANTA 8

ACRO
WELDER MFG. CO.
MILWAUKEE

WELDING ENGINEERS

MACHINERY BUILDERS

ESTABLISHED
1936

STEEL the Metalworking Weekly

Editor-in-Chief, IRWIN H. SUCH

Editor, WALTER J. CAMPBELL

Associate Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY .....Market Editor
ROBERT F. HUBER .....Machine Tool Editor
HARRY CHANDLER .....Copy Editor
GLENN W. DIETRICH....Associate Copy Editor
FRANK R. BRIGGS .....Associate Editor
ROBERT O. JAYNES .....Associate Editor
AUSTIN E. BRANT .....Associate Editor
ROSS WHITEHEAD .....Associate Editor
GEORGE J. HOWICK .....Associate Editor
NEIL C. ROBERTS .....Associate Editor
DERRY EYNON .....Assistant Editor
DONALD E. HAMMERSTROM..Assistant Editor
JOHN TERESKO .....Assistant Editor
WILLIAM M. OLDS .....Assistant Editor
MARY T. BORGERHOFF .....Assistant Editor
MARY ALICE EARLY .....Assistant Editor
EILEEN CORTES .....Assistant Editor
MARY ANN STUVE .....Editorial Assistant

JANE WEDGE, Editorial Assistant

THOMAS H. BRYAN, TOM WELSH, Art Editors

IRENE KASNER, Editorial Service

Resident Editors

New York 17 .....60 E. 42nd St.
B. K. PRICE, L. E. BROWNE
BRIAN WILSON
Murray Hill 2-2581

Chicago 11 .....520 N. Michigan Ave.
ERLE F. ROSS, WILLIAM E. DEAN
Whitehall 4-1234

Pittsburgh 19 .....2837 Koppers Bldg.
WILLIAM V. WALLACE—Atlantic 1-3211

Detroit 35 .....15800 W. McNichols Rd.
A. DONALD POSTMA—Broadway 3-8150

Washington 4 ....1123 National Press Bldg.
JOHN R. BOTZUM—Executive 3-6849

Editorial Correspondents

Buffalo—Emerson 5385 ....GEORGE E. TOLES
Youngstown—Riverside 7-1471. .GEO. R. REISS
Cincinnati—Beechmont 1-9607...DICK HAVLIN
Birmingham—Birmingham 3-1121 R. W. KINCEY
St. Louis—Garfield 1-1212 HAMILTON THORNTON
Houston—Hudson 6-5236 .....ROBERT SHIRK
Los Angeles—Webster 5-1234..NORMAN LYNN
San Francisco—Yukon 6-5151 EDWIN HAVERTY
Seattle—Melrose 2-1895 .....R. C. HILL
Toronto, Canada—Empire 4-9655..F. S. TOBIN
Birmingham, England .....J. A. HORTON
Brussels, Belgium .....PAUL DE KEYSER
Dusseldorf, Germany, DR. HERBERT GROSS

BUSINESS STAFF

Business Manager, D. C. KIEFER

Asst. Business Mgr.....C. A. TALLINGER JR.
Advertising Service Mgr. ...DORIS MITCHELL
Production Manager .....A. V. ANDERSON
Classified Advertising .....EVELYN DIETZ
Promotion Director .....S. F. MARINO
Market Research Mgr. ....T. M. BALLANTINE
Circulation Director .....J. C. GERNHARD
Distribution Manager .....G. R. EBERSOLE

Reprints, JUNE SCHILENS

Advertising Representatives

New York 17 .....60 E. 42nd St.
K. A. ZOLLNER, GUY LABAW
Murray Hill 2-2581

Wynnewood, Pa. (Phila.) 200 Wynnewood Ave.
WM. J. VERSCHOOR—Midway 2-6512

Farmington, Conn. .....12 Farmstead Lane
CALVIN FISHER JR.
Orchard 7-1756

E. Rochester, N. Y. .....217 Ridgeview Dr.
HAROLD A. DENNIS—Browning 1-2105

Pittsburgh 19 .....2837 Koppers Bldg.
J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13 .....Penton Bldg.
J. K. GILLAM, N. W. MANNING—Main 1-8260

Cincinnati 6 .....2215 Victory Parkway
E. L. FRANKE—Parkway 1-0711

Detroit 35 .....15800 W. McNichols Rd.
DONALD C. HYDE
Broadway 3-8150

Chicago 11 .....520 N. Michigan Ave.
L. C. PELOTT, W. L. POLAND
WM. J. D'ALEXANDER, RICHARD BIRDSONG
Whitehall 4-1234

Los Angeles 36 .....5943 W. Colgate Ave.
F. J. FULLER—Webster 1-6865

San Francisco 4 .....57 Post St.
Robert W. Walker Co.—Sutter 1-5568

Griffin, Ga. .....1106 Pine Valley Rd.
FRED J. ALLEN—Griffin 7854

Clearwater, Fla. .....1954 Jeffords Dr.
H. G. ROWLAND—(Clearwater) 39-9493

Dallas 35 .....818 Exchange Bank Bldg.
JAMES H. CASH—Fleetwood 1-4523

BPA

NBP

Published Every Monday by
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, Ohio
MAin 1-8260

GEORGE O. HAYS .....Chairman
RUSSELL C. JAENKE .....President
FRANK G. STEINEBACH .....Vice President and Secretary
FRANK O. RICE .....Vice President
JOSEPH P. LIPKA .....Treasurer and Assistant Secretary

Also Publisher of
FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION
Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors, and National Business Publications Inc.

DON'T TELL YOUR COMPETITORS

there's enough "EXTRA" here to give you an EDGE

SCOVILL

QUALITY CAN PUT YOU AHEAD OF COMPETITION

Many a Scovill customer has said to us, in effect, "We're doing so well with Scovill Mill Products that it's giving us a nice little 'edge' on the competition. Don't tell our competitors". But that kind of "secret" cannot be kept for long, and it's a fact that more and more fabricators are following up the smart lead and switching to a higher standard of quality in Scovill Brass • Copper • Aluminum. They're finding that Scovill's deliberately planned program of constant improvement in mill production equipment and methods pays off in results on the fabricator's own production line.

You can buy Brass • Copper • Aluminum Mill products from many sources . . . BUT Scovill fabricator-oriented services are available only from . . . the source of Mill Products bearing this Trademark.

BRASS • COPPER • ALUMINUM

Scovill Manufacturing Company, Mill Products Division, 99 Mill St., Waterbury 20, Conn. Phone Plaza 4-1171.

11SC5R

SENDZIMIR ROLLED

BRASS STRIP and ALUMINUM SHEET

Here is the last word in rolling mill equipment and coordinated precision controls for production of brass strip and aluminum sheet to far closer dimensional tolerances and with far superior micro-inch finish than that available under previous commercial standards.

Fabricators who have been awaiting materials of such "super" accuracy, uniformity and micro-inch surface finish can expect these important benefits:—

- A dependably close ratio between anticipated footage of metal, weight of metal and actual parts produced, because of precision controlled gauge tolerances.
- Fewer press or other machine adjustments and longer tool wear with the use of metal that is more uniform in all respects.
- Superior finish and appearance of parts as a result of much closer micro-inch finish control.

Fabricators requiring this extra measure of quality, this extra aid to maximum economy in production of brass or aluminum parts, are invited to discuss this new Scovill Service.

MADE IN U.S.A. TO THE STANDARDS OF AMERICAN INDUSTRY

made better to bring out the ***BEST*** *in your products*

it ***PAYS*** *to specify...*

BRASS

COPPER

ALUMINUM

MILL PRODUCTS

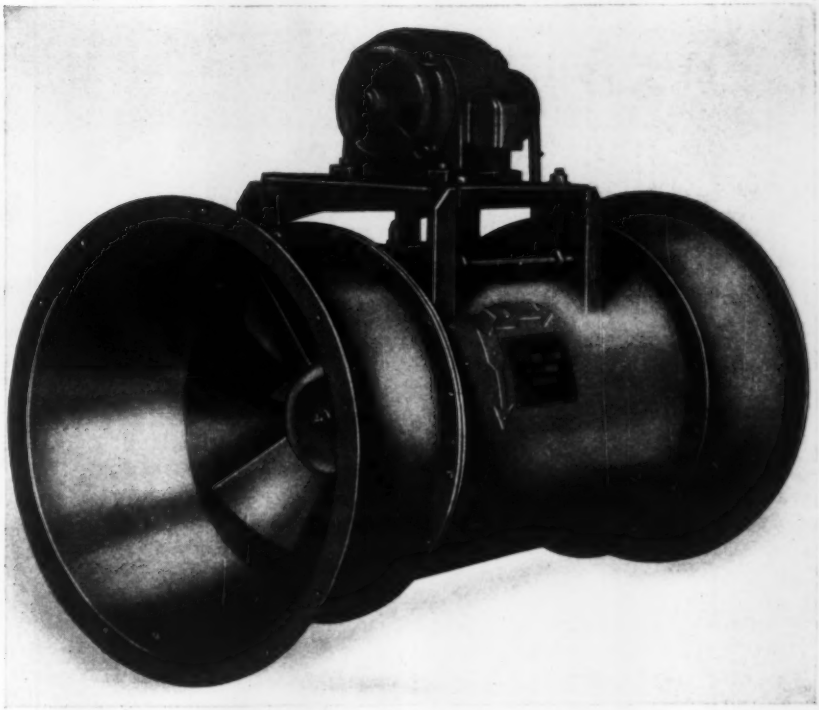
identified by this trademark

SCOVILL ®

Scovill Manufacturing Company, Mill Products Division, 99 Mill St., Waterbury 20, Conn. Phone PLaza 4-1171.

9SC59

- **Quiet Running**
- **Easy, Economical Installation**
- **Maintenance-Free Long Life**
- **Compact**
- **Lighter Weight**
- **Ruggedly Built**
- **Wide Range of Capacities**



"Buffalo" Type "B" Vaneaxial Fan

"BUFFALO" AXIALS SIMPLIFY MANY DIFFICULT INSTALLATIONS

"Buffalo" Axial Flow Fans are easily and economically installed because of their rugged, lightweight compactness. In all but the largest sizes, no heavy foundations or structural support are needed. "Buffalo" Axials can be installed as part of the pipe or stack in hood, vat and other roof exhaust systems.

Many ordinarily difficult installations are greatly simplified by mounting "Buffalo" Axials in straight duct runs. Duct-size, they save valuable space.

With "Buffalo" Axials, you are assured a minimum of service calls. Superb engineering and husky construction contribute to long, trouble-free life.

The "Buffalo" reputation for consistent high quality is backed by over 82 years of air-moving experience.

"Buffalo" Axials are quiet and highly efficient in many space-saving installations. These include paint spray booth exhaust, circulation of chilled air for quick-freezing, boiler room cooling, for supply and exhaust in textile plants, and many other uses. Choose from a wide variety of sizes and types to suit the needs of your installations.

Remember, when you specify "Buffalo" Axial Flow Fans, you bring your customers the finest possible performance. Call your "Buffalo" engineering representative, or write for Bulletin 3533-H.

BUFFALO FORGE COMPANY
Buffalo, N. Y.

Buffalo Pumps Division, Buffalo, N.Y.
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING • AIR CLEANING • AIR TEMPERING • INDUCED DRAFT • EXHAUSTING • FORCED DRAFT • COOLING • HEATING • PRESSURE BLOWING

HOW LOUIS ALLIS DOUBLED THE BENEFITS OF SIL-FOS BRAZING

Higher operating temperatures and output demands in electric motors have prompted Louis Allis of Milwaukee, Wisconsin, to switch from soft solder to SIL-FOS 5 brazing on their stator windings. No stranger to SIL-FOS, Louis Allis has brazed rotor end rings for years. Now they get these benefits on both vital parts of their motors:

STRENGTH—The strength of a properly designed and brazed SIL-FOS joint exceeds that of the metals joined. Furthermore, joints do not "creep" even when hot. Here are some typical values:

at 300° F in copper:	30,000 psi.	In brass:	35,000 psi.
at 400° F in copper:	28,000 psi.	In brass:	31,000 psi.

CONDUCTIVITY—Tightly fitted standard lap joints are fully as conductive as copper.

DUCTILITY—SIL-FOS joints have exceptional ductility; enabling them to withstand stresses and strains of vibration, shocks and radical temperature changes fully as well as the metals they join.

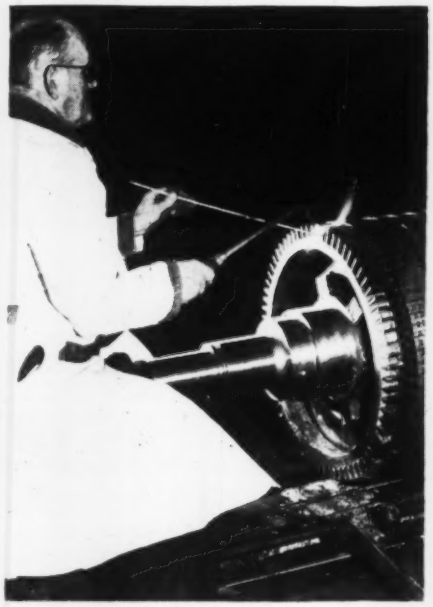
EASY INSTALLATION—FAST PRODUCTION—With SIL-FOS you can get any production you want—you have a choice of heating methods, jigging setups, inspection techniques, etc.

ECONOMY—Low flow point, fast brazing action, reduced labor costs, and vastly reduced reject rate, plus the small amount of alloy needed to make a joint put SIL-FOS in a low-cost category unequaled by other methods.

Alloy	Silver Content %	Type	Starts to flow at °F	Starts to flow at °C	Free Flowing at °F	Free Flowing at °C
SIL-FOS	15	Wide Melting Range	1185	641	1300	704
SIL-FOS 5	5		1195	646	1300	704

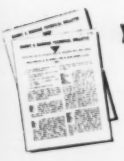
For use in joining ONLY nonferrous metals. Used particularly on copper, brass and bronze. Specially effective in joining pipe and tubing and on electrical work.

Here, operator hand brazes a winding on a motor stator. Increasing motor output requirements demand greater overall operational reliability. With SIL-FOS 5 brazed joints *reliability is assured.*



Rotor ring hand brazing with SIL-FOS has long been the practice at the Louis Allis Co. The success achieved here has been applied to the above with equally excellent results.

Further details on SIL-FOS and SIL-FOS 5 can be had in the form of Technical Literature from Handy & Harman. **Send for Bulletin 20.** Our research and engineering people are ready and willing to help you with any metal joining problem or plan you may have.



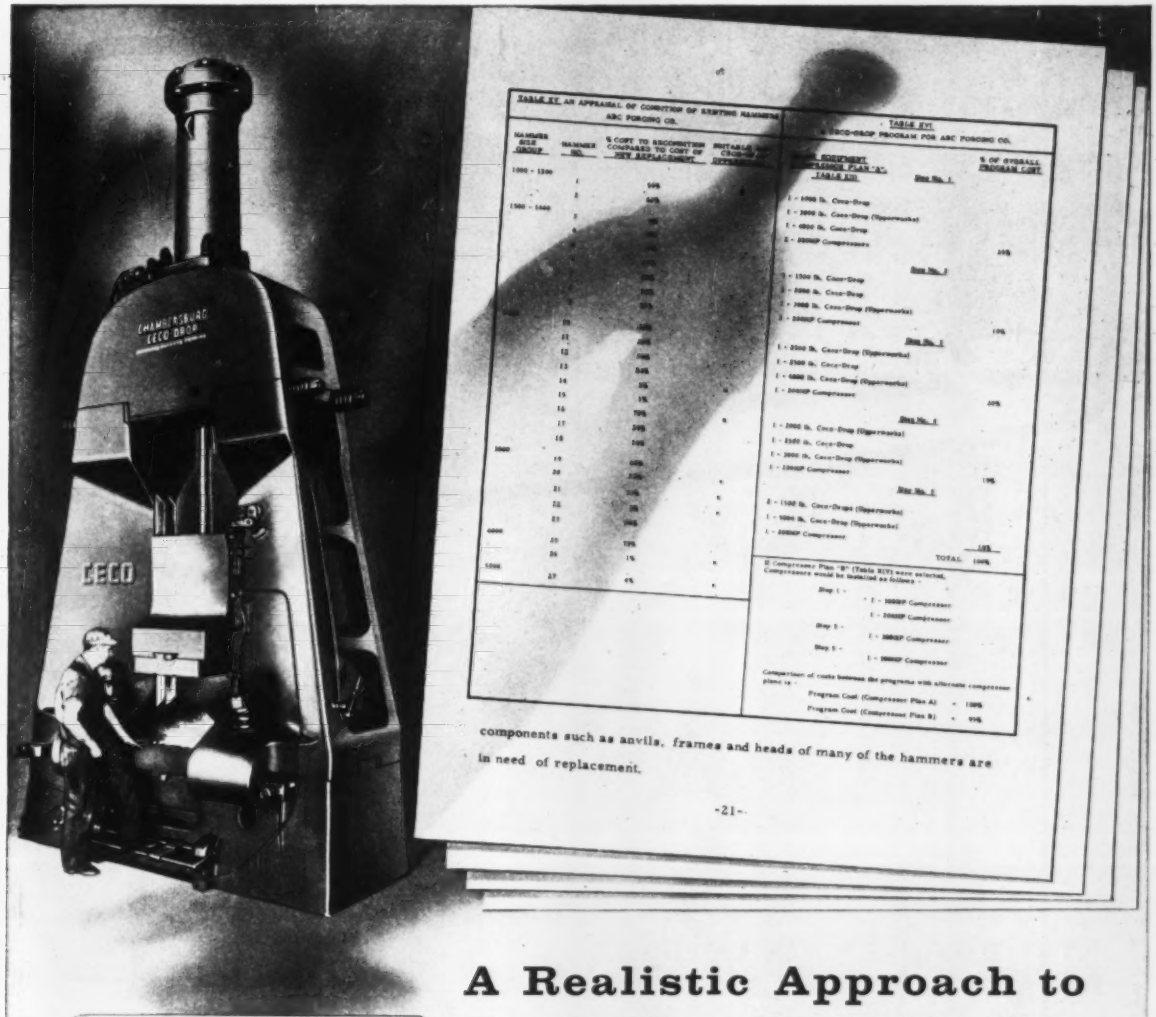
Your NO. 1 Source of Supply and Authority on Brazing Alloys

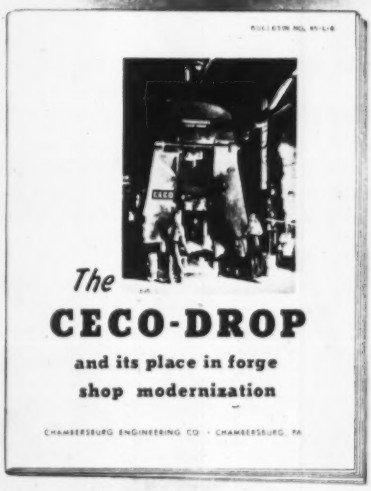
HANDY & HARMAN

General Offices: 82 Fulton St., New York 38, N. Y.

DISTRIBUTORS IN PRINCIPAL CITIES

OFFICES AND PLANTS
BRIDGEPORT, CONN.
PROVIDENCE, R. I.
CHICAGO, ILL.
CLEVELAND, OHIO
DETROIT, MICH.
LOS ANGELES, CALIF.
OAKLAND, CALIF.
TORONTO, CANADA
MONTREAL, CANADA

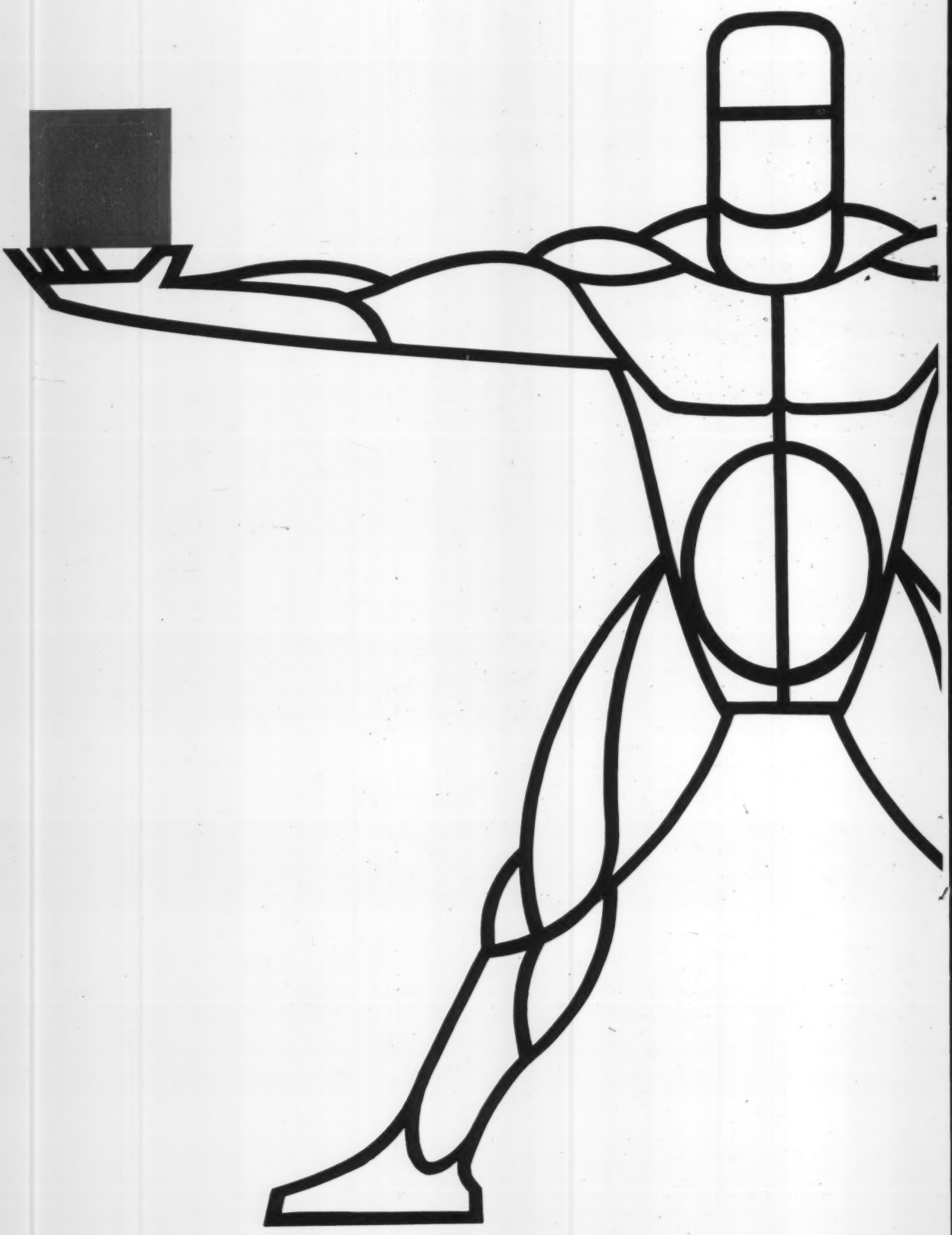


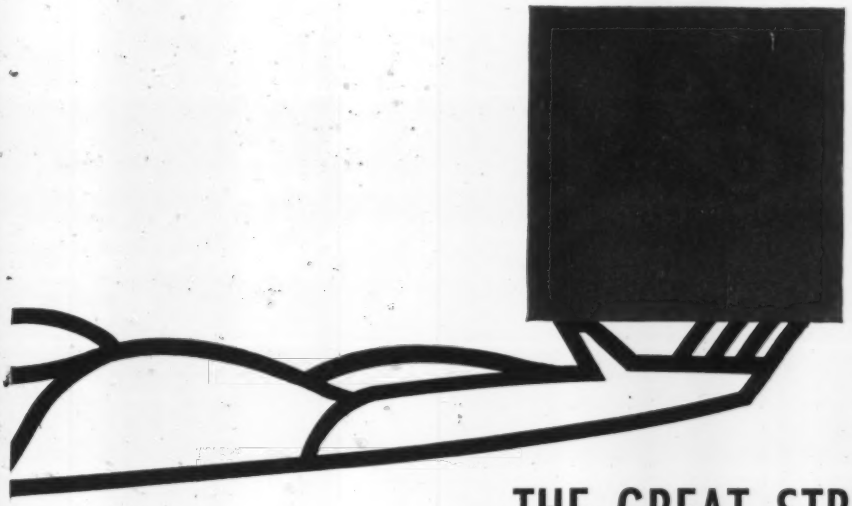


A Realistic Approach to Forge Shop Modernization

During the past few years, mounting competition has caused forge shop managers to seek ways to further increase production and reduce costs. A number have scrapped their old board hammers replacing them with Ceco-Drops, the modern piston-lift gravity-drop hammer. These shops have thus placed themselves in a position to get more business—and they are getting it! ● A wealth of helpful information is available in Chambersburg's new 28 page forge shop modernization bulletin. Based on studies made in prominent forge shops, this publication assists you to formulate your own step-by-step modernization program. Write for a copy today.

CHAMBERSBURG ENGINEERING COMPANY · · CHAMBERSBURG, PA.

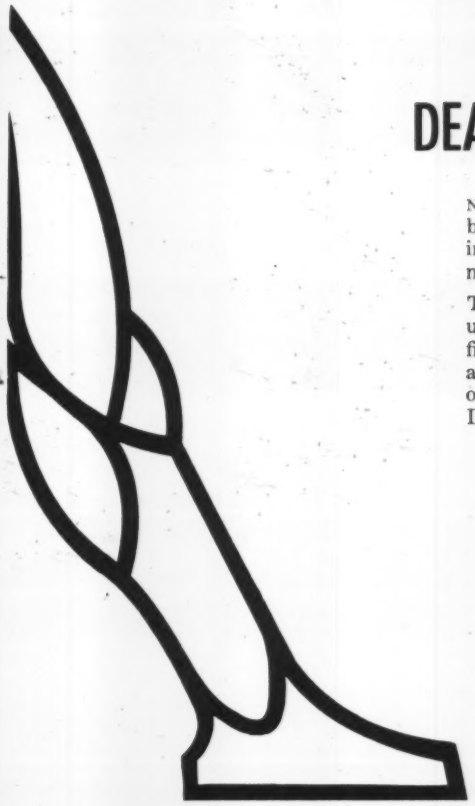




THE GREAT STRENGTH OF N-A-XTRA LETS YOU ELIMINATE COSTLY DEAD WEIGHT FROM YOUR PRODUCTS

N-A-XTRA is the best low-alloy, extra high-strength steel you can buy. Heat-treated, fully quenched and tempered, it's now available in minimum yield strength levels of 80,000—110,000 psi. This is nearly three times the strength of ordinary carbon steel.

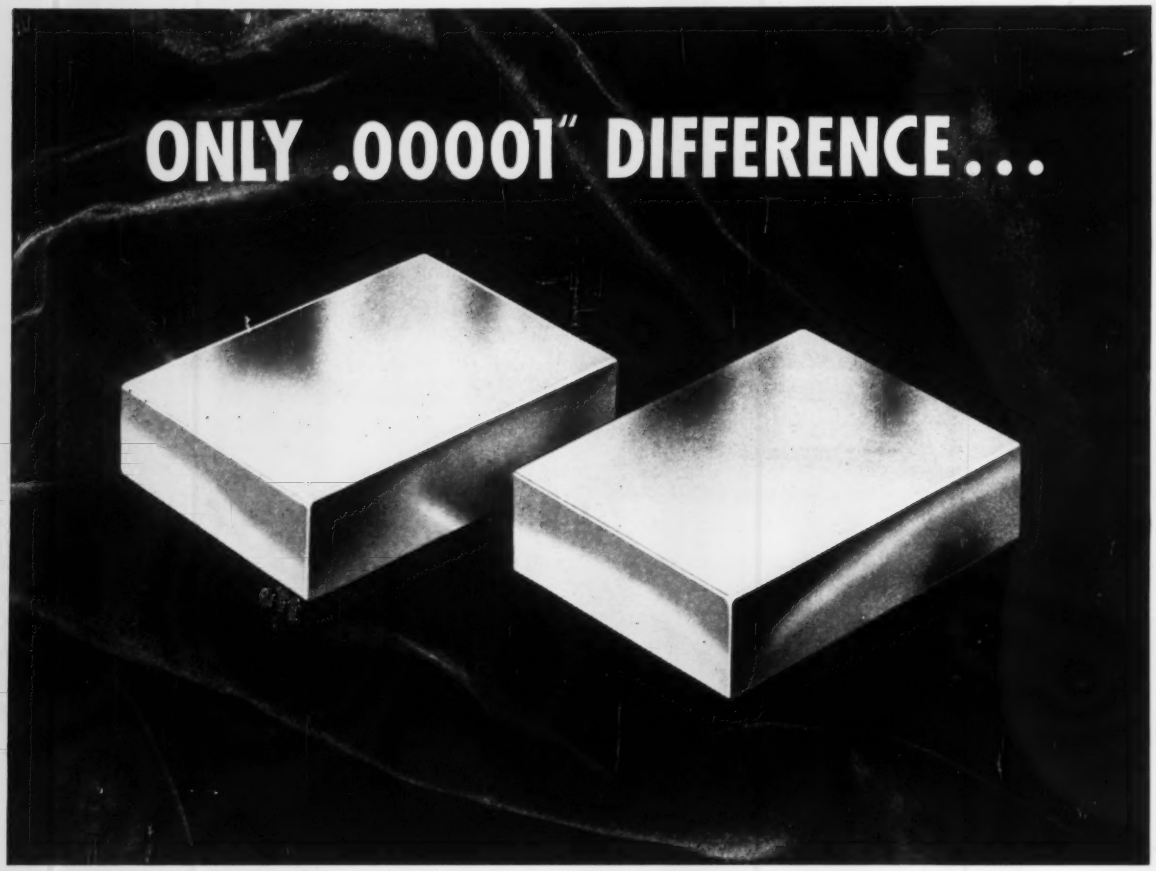
The great strength of N-A-XTRA gives engineers and designers a unique opportunity to eliminate bulky, useless dead weight from finished products. Production men will delight in its superior formability and superb weldability. Send today for our illustrated brochure on N-A-XTRA HIGH-STRENGTH steel. Great Lakes Steel Corporation, Detroit 29, Michigan, Dept. B-8.



N-A-XTRA

GREAT LAKES STEEL

A DIVISION OF NATIONAL STEEL CORPORATION



but one is a gage block...the other is junk!

In maintaining the high standards of precision required in your products, you certainly wouldn't waste good money on measuring equipment that merely "comes close." Either it's right or it isn't. The same is true in balancing.

What about your balancing tolerances?

Today's tolerances are far more critical than those of just a few years ago—and tomorrow's higher speeds will require even greater accuracy in rotating parts. To depend on "close enough" is risky.

What are your needs?

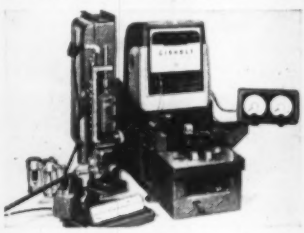
Your choice of balancing equipment could have an important effect on your future competitive standing. Your product quality and unit cost will be affected by all of these balancing factors that should be considered before you buy ANY machine: capacity required based on present and future needs; accuracy of plane separation and angular location of unbalance; simple calibration to permit amount indication in terms of correction methods you actually use; and integral correction equipment. Quick setup and fast, simple operation by unskilled operators can mean substantial savings, too!

Test *before* you buy!

To help you determine your needs and to simplify the job of comparing competitive machines, Gisholt offers you a new booklet, "Performance Tests for Balancing Machines." This details a series of tests on which no reliable supplier will refuse to cooperate. Ask your Gisholt Representative for your free copy—or write us.

HS-1 Balancer cuts costs, ups accuracy on 2¼ oz. aircraft control motor armature assemblies.

Part operates at 13,600 r.p.m. Bearing movements must not exceed 0.000050". Unbalance corrected in special drill press fixture (at left in photo). Production, more than 15 parts per hour, including correction by drilling at the 0.245" O.D. radius in two transverse planes only ½" apart, and inspection.



GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

Investigate Gisholt's Extended Payment and Leasing Plans

Turret Lathes • Automatic Lathes • Balancers • Superfinishers • Threading Lathes • *Factory-Rebuilt Machines with New-Machine Guarantee*

For extra high strength wire rope...

use CF&I-Wickwire *Double Gray*

The CF&I Image reflects CF&I's experience as a producer of many steel products and CF&I's versatility in developing new products to meet exacting requirements . . . like Wickwire Double Gray*.

The special steel used in Double Gray provides extra resistance to the deforming effects of peening and crushing which occur on the drums and sheaves of heavy equipment. Double Gray also gives extra resistance to abrasion.

Because of these superior qualities, Double Gray rope quickly repays its slightly higher initial cost in safer, more economical operations. Use it wherever extra high strength wire rope is required.

For a free copy of our Double Gray booklet, write to: Advertising Department, The Colorado Fuel and Iron Corporation, 575 Madison Avenue, New York 22, N. Y.

**Wickwire Double Gray Wire Rope is made of extra-improved plow steel. Fortified by an independent wire rope core of the same extra high strength steel, Double Gray rope has a 15% higher breaking strength than the catalog breaking strength of an improved plow steel rope with IWRC.*

6632

WICKWIRE ROPE

THE COLORADO FUEL AND IRON CORPORATION

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque · Amarillo · Billings · Boise · Butte Denver · El Paso · Farmington (N.M.) · Fort Worth · Houston · Kansas City · Lincoln · Los Angeles · Oakland · Odessa (Tex.) Oklahoma City · Phoenix · Portland · Pueblo · Salt Lake City · San Francisco · San Leandro · Seattle · Spokane · Tulsa · Wichita

In the East: **WICKWIRE SPENCER STEEL DIVISION**—Boston · Buffalo · Chattanooga · Chicago · Detroit · Emlenton (Pa.) New Orleans · New York · Philadelphia

CF&I STEEL

"Leave scratchin' an' peckin' to the chickens —

Use AIRCO EASY ARCSTARTS!"

The first time you try Airco's new EASY ARCSTART Electrodes you'll never go back to scratchin' an' peckin' with yesterday's electrodes.

Welding mild or low alloy steel, or hardfacing? Airco EASY ARCSTART Electrodes enable you to *use lower amperage for starting, if desired; strike an arc the first time; and do it easier than ever before.*

The tip coating does the trick. This is the cap at the striking end of EASY ARCSTART Electrodes – a special metallic compound that instantly initiates arc current.

Airco EASY ARCSTART Electrodes are available in diameters from 1/16″ to 5/32″... for mild steel, low alloy steel and some hardfacing electrodes.

For samples, write on your letterhead ... or phone your nearby Authorized Airco Dealer. He's listed in the Yellow Pages under "Welding Equipment and Supplies".

AIRCO®

AIR REDUCTION SALES COMPANY

A division of Air Reduction Company, Incorporated

150 East 42nd Street, New York 17, N.Y.

Offices and authorized dealers in most principal cities

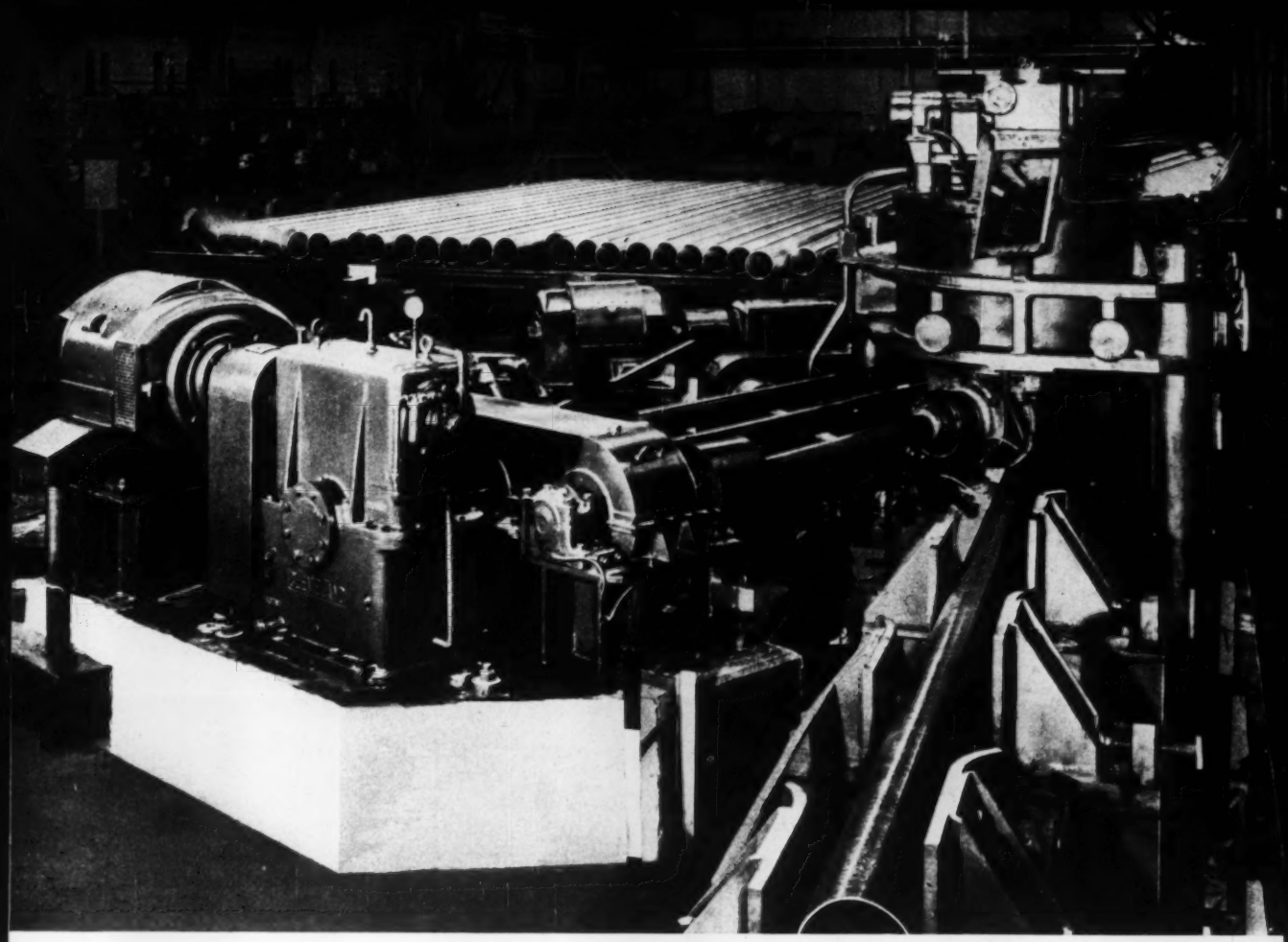
On the west coast—
Air Reduction Pacific Company

Internationally—
Airco Company International

In Cuba—
Cuban Air Products Corporation

In Canada—
Air Reduction Canada Limited

All divisions or subsidiaries of Air Reduction Company, Inc.



How to straighten the really big pipe!

One major Eastern steel producer has found the answer – the big Mack-Hemp Model A-5 Straightener shown above – the largest of its type in the world!

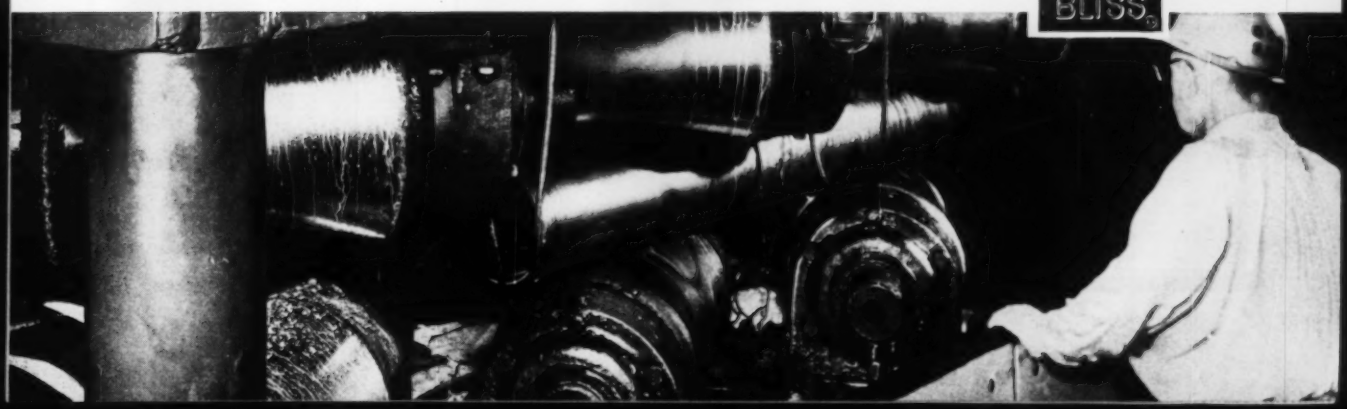
This A-5 takes really big bowed pipe from the sizing mill, pulls it in through three pairs of opposed cross rolls and then spins it out straight and round to high tolerances in only a single pass.

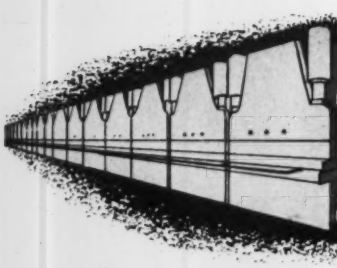
This despite the fact that the steel pipe being straightened is 16-inch in diameter, fifty feet in length!

To do a job like this, of course, the massive 85-ton roll frame is a must, as are the heavy duty rolls, and the combined 200 HP motors used to drive all six of them. In its first year, this Mack-Hemp A-5 straightener has handled more than 200,000 tons of pipe.

If straightening pipe or tubing is your problem – any size, any alloy – consider doing it yourself. The men from Mack-Hemp will be glad to give you all the facts you'll want to know.

MACKINTOSH-HEMPHILL
Division of E. W. BLISS Company
Pittsburgh and Midland, Pa.





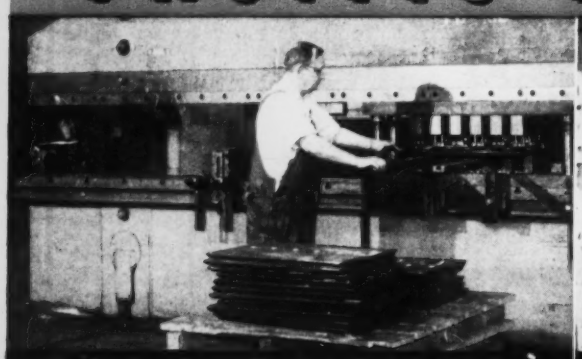
4,769 years to arrive ACCURATE HYDRAULIC

122 out of 124 hydraulic press brakes in U.S. aircraft industry are PACIFIC

Aircraft manufacturers work to the closest tolerances of all industries in metal forming. Douglas Aircraft Company, Tulsa, Oklahoma, with 8 Pacific Brakes (above) is typical of the airframe manufacturers who have selected Pacific for its precise accuracy.

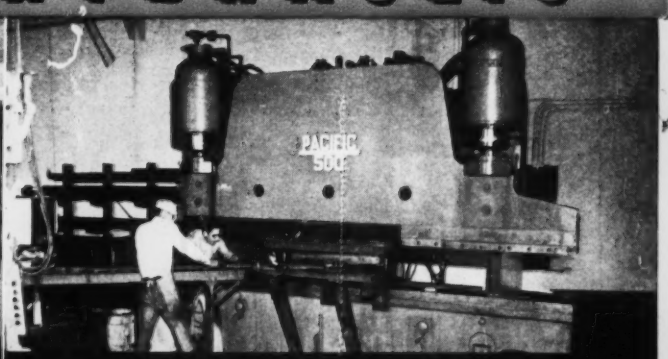
924 PACIFIC Brakes, representing over 95% of all hydraulic press brakes in use today, have operated for an aggregate of 4,769 years to test and confirm PACIFIC designs that have established hydraulic press brakes as far more profitable to operate than mechanical brakes. However, only PACIFIC has precise accuracy, versatility, high speed and dependability that comes from years of experience in manufacturing, developing and improving this unique machine. It is the only hydraulic press brake in daily operation that is actually air bending, straightening, deep drawing, blanking, and doing heavy punching. Accuracy within thousandths of an inch (greater than with any mechanical or other hydraulic brake) repeats itself on every stroke. Ram remains level regardless of location of work on the bed. PACIFIC sizes range from 60 tons to 1500 tons.

PACIFIC HYDRAULIC



Only hydraulic brake built for HEAVY PUNCHING

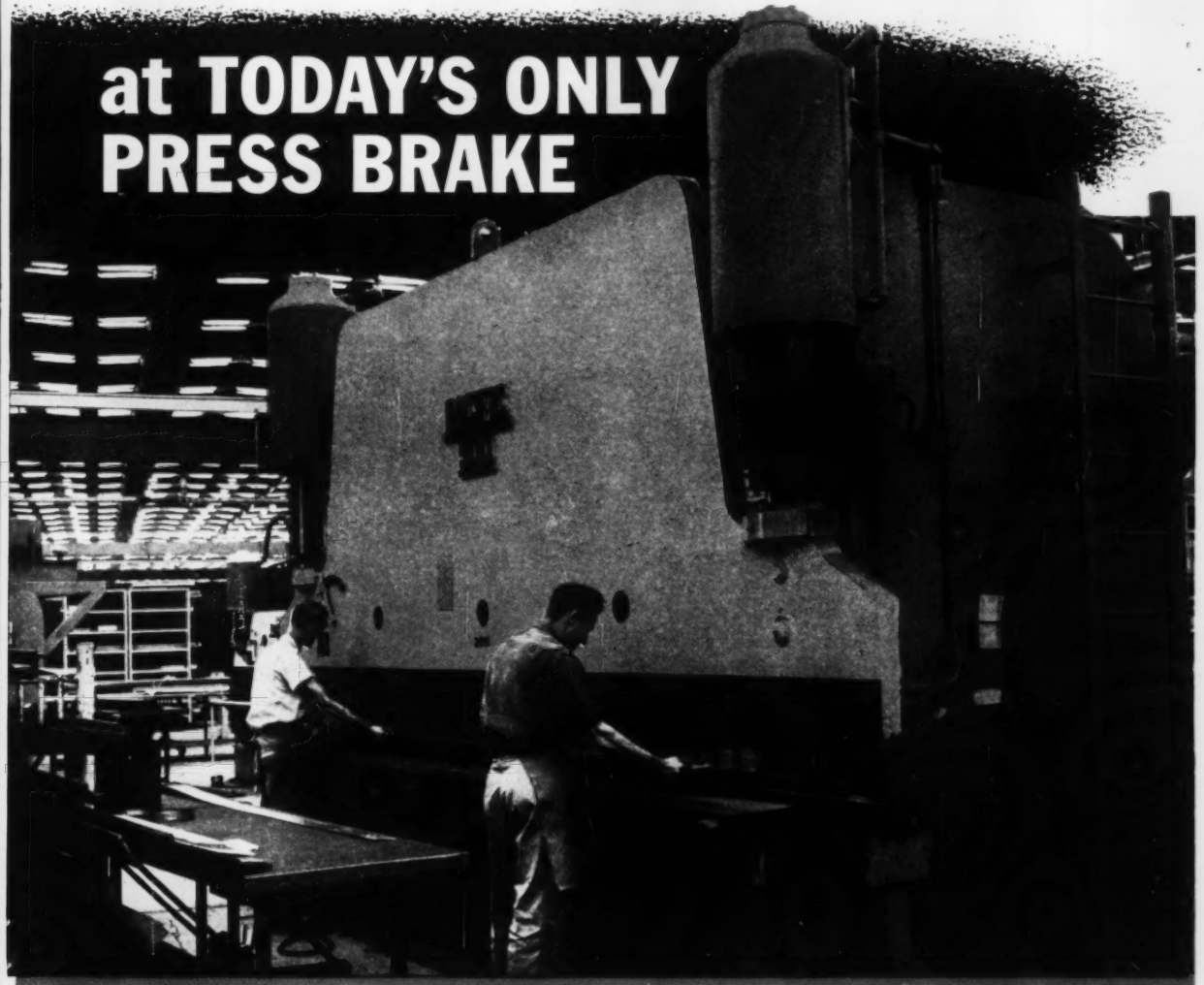
Pacific is uniquely designed to absorb heavy shock from punching in the hydraulic system rather than in the frame of the brake. Cushioned against shock, punch and dies stand up from 3 to 8 times longer than with mechanical brakes. Photo (above) shows 1" alloy steel plate being punched at earthmoving equipment plant.



MAINTENANCE-FREE for years

Dependable, simplified electrical and hydraulic controls can easily be kept working continuously by any plant maintenance crew. There are no complicated electronic devices. In photo (above) at agricultural equipment plant, the 500 ton Pacific Hydraulic Brake shearing ¾" alloy steel plate with Pacific Shearing Attachment has operated continuously for the first 4 years at a cost of $5.22 in replacement parts.

at TODAY'S ONLY PRESS BRAKE



PRESS BRAKE

HIGH SPEED operation

Pacific adjustable stroke length can be shortened for rapid stroking. Automatic, self-leveling ram permits use of progressive dies across entire bed of press. The automatically-fed Pacific at automotive parts plant, which can cycle up to seventy 1½" strokes per minute, is forming 3780 operations per hour in the above photo. In virtually any operation, Pacific's high cycling speed equals or exceeds materials handling capacity.

Write for brochure

PACIFIC INDUSTRIAL MANUFACTURING COMPANY

848 49th AVE., OAKLAND, CALIF.

PLANTS:

OAKLAND, CALIF. and MT. CARMEL, ILL.

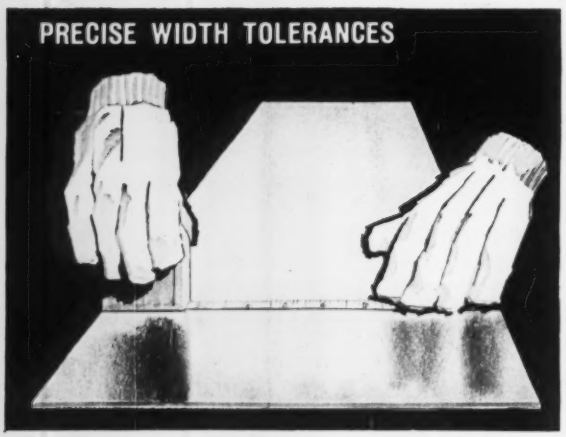
DISTRIBUTORS: ALBUQUERQUE, N. M.; DENVER, COLO.–R. E. Duboc Associates • BIRMINGHAM, ALA.–W. H. Sleeman • CHICAGO, ILL.; MILWAUKEE, WIS.; MINNEAPOLIS, MINN.–The Gute Co. • CLEVELAND, OHIO–Wigglesworth Machinery Distributors • DALLAS, TEX.–Machine Tool Associates • DETROIT, MICH.–Taylor-Thompson Machinery Co. • HOUSTON, TEX.–Butcher, Carter & Preston Co. • INDIANA; LOUISVILLE, KY.–Harry B. Green Machinery Co. • KANSAS CITY & ST. LOUIS, MO.; DES MOINES, IOWA–Maehlenpah Engr. Co. • LOS ANGELES, CALIF.; ARIZONA–Tornquist Machinery Co. • MT. VERNON, N. Y.–William Halpern & Co., Inc. • NEW ORLEANS, LA.–Dixie Mill Supply Co. • NORFOLK, VA.–Tidewater Supply Co. • PITTSBURGH, PA.–Steel City Tool & Machinery Co. • PORTLAND, ORE.–Portland Machinery Co. • ROCHESTER, N. Y.–Ogden R. Adams Co., Inc. • SALT LAKE CITY, UTAH–Todd Machinery Co. • SEATTLE, WASH.–Buckner Weatherby Co. • TULSA, OKLA.–Martin Machinery Co. • WETHERSFIELD, CONN.–Beisel Machinery Co. • WYNNEWOOD, PA.–Edward A. Lynch Machinery Co. • TORONTO, ONT.–Hercules Presses, Ltd.

Where precision is important . . .

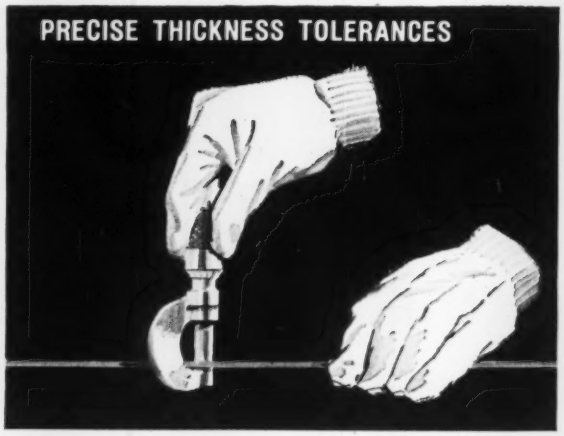
use USS Amerstrip, the "quality-

USS Amerstrip is a specialty product, rolled in quantities that permits production on precision machines, tailored to the customer's product specifications. When you use USS Amerstrip you get seven important "quality controls" not obtainable with other manufacturing methods.

The finish you get on your Amerstrip order has been specially prepared to meet *your* product's needs.



If your fabricating machines require a special width strip that's just what you'll get with Amerstrip. USS Amerstrip can be produced in any width under 24 inches . . . well within exacting tolerance limits.

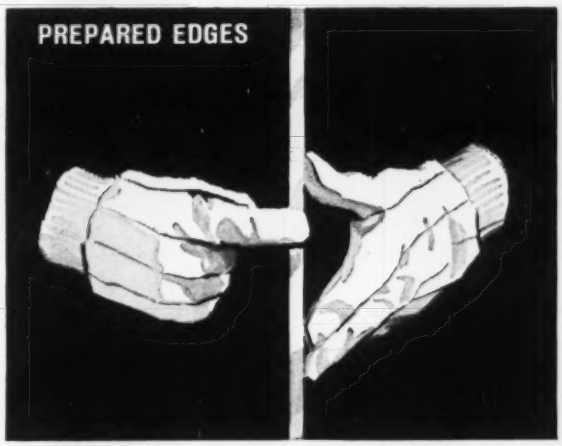


USS Amerstrip can be supplied in the thickness your machines demand. USS Amerstrip is fabricated on large production runs down to thickness tolerances as close as plus or minus .0005 inches.

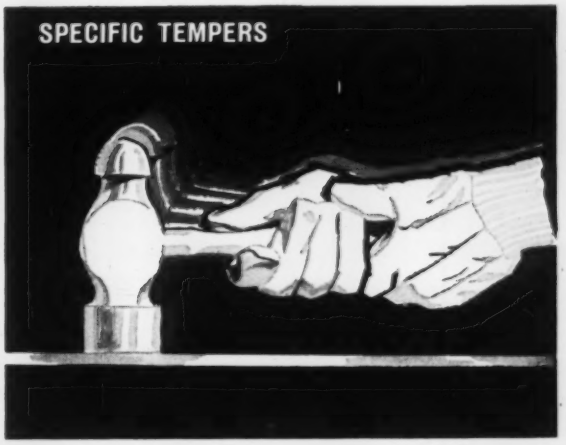
American Steel & Wire representatives are experts in the fabrication and application of USS Amerstrip Cold Rolled Strip. Whenever you have a need or problem involving cold roll let these experts show you how USS Amerstrip can do it better. Get in touch with our nearest representative or write to American Steel & Wire, Dept. 9281, 614 Superior Ave., N.W., Cleveland 13, Ohio.

USS and Amerstrip are registered trademarks

controlled" cold rolled strip steel



Because USS Amerstrip is produced in precision, order-size quantities, it can be supplied with the edge finish you need . . . square, standard, round, full round or bevel.



Whether your product must undergo a deep draw or other severe forming operation or require a special temper for rigidity, you'll get the exact temper you need when you order USS Amerstrip.

Whatever the size of your order . . . very large or very small, every coil of USS Amerstrip will be uniform in finish, in temper, in width and thickness. The use of USS Amerstrip will assure continuous production and high yields.

DESIGNED FOR END USE

This is really the sum total of all these other advantages. Because USS Amerstrip is "Quality-Controlled," because it is engineered to meet your needs, it assures you smoother, faster operation; a better, more salable finished product.

American Steel & Wire Division of United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, New York

"Dad believes in good guns and good gun manners"

"He just bought me a new gas-powered Hahn BB rifle. It's real sharp and shoots straight, but he won't let me use it alone until I've learned good gun manners."

Hahn BB guns, styled after famous lever-action Western frontier rifles, have the look and feel of Dad's guns—and they shoot straight. This is due to the accuracy of the barrels. They are made from commercial grade Superior carbon steel tubing —known for the consistent uniformity of its ID finish, free machining characteristics and economy.

Examples of other unusual applications of this Superior tubing

- Carbon steel rectangular tubing for collimating tubes in a research reactor (.900 in. x .400 in. ID x .025 in. wall in 10-ft. cuts)
- Specially conditioned ID tubing in long lengths used as high pressure diesel lines on earthmoving equipment (¼ in. OD x .088 in. ID)
- Cadmium plated compression sleeves for connecting the steel core of ACSR high tension cable (.404 in. OD x .179 in. ID in 5-in. cuts)
- 2½ million ft. of carbon steel tubing in random lengths for the gear pinion in the timing fuse of artillery shells (.204 in. OD x .067 in. ID)

Filling tubing orders that range from a few feet to millions, in a wide variety of materials, shapes and sizes, calls for the resources Superior has to offer. Why not investigate the advantages of using us as a source of tubing. Bulletin 41, a guide to the selection and application of Superior tubing, is yours for the asking. Write Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

Superior Tube

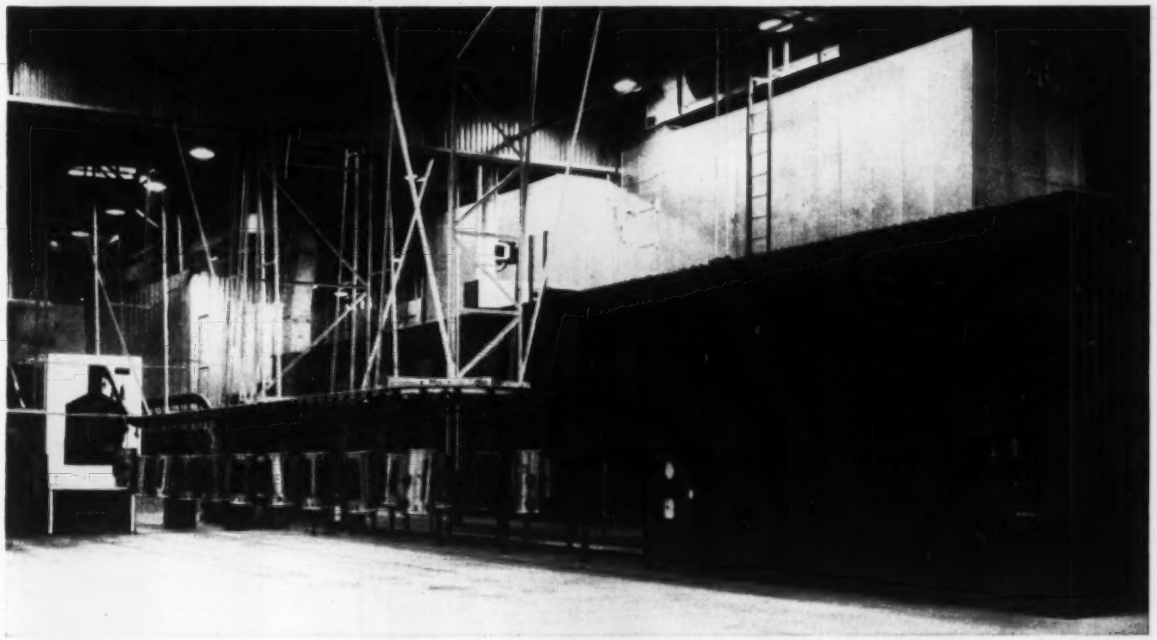
The big name in small tubing

NORRISTOWN, PA.

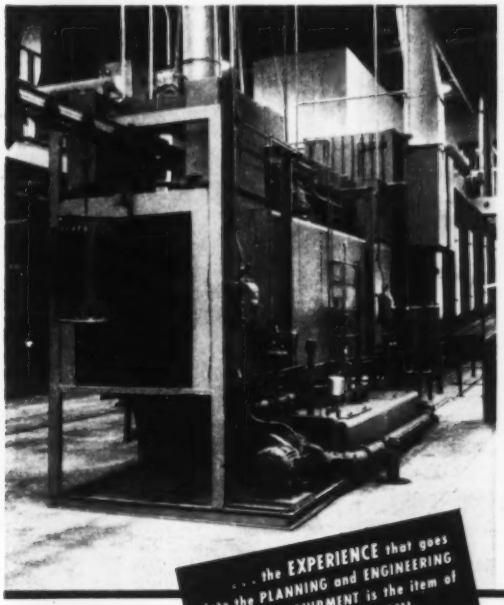
All analyses .010 in. to ⅝ in. OD—certain analyses in light walls up to 2½ in. OD

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. • RAymond 3-1331

FINISHING SYSTEMS . . .



Mahon Combined Flow Coating and Spray Painting Machines Paint Transformer Tanks Automatically at Westinghouse!



. . . the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!

In a complete automatic Finishing System, recently installed by Mahon in the Westinghouse plant at Athens, Ga., transformer tanks with recessed bottoms are painted automatically, inside and outside, in an inverted position as they pass through specially designed, combined Flow Coating and Automatic Spray Painting Machines—tanks are rotated as they pass through the two simultaneous coating processes. Four coats of paint are applied and each is oven-baked on one continuous line that passes through Four Automatic Painting Machines—one is shown at left.

Other Mahon equipment in this Westinghouse plant includes a Transformer Coil Dehydrating Oven and a second Complete Mahon Finishing System for applying the final coat on completely assembled transformers.

If you are considering a new finishing system, or any unit of finishing or processing equipment, you will want to discuss methods, equipment requirements and possible production layouts with Mahon engineers . . . you'll find them better qualified to advise you, and better qualified to do the initial planning and engineering which plays such an important role in the ultimate operating efficiency of specially designed equipment of this type.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

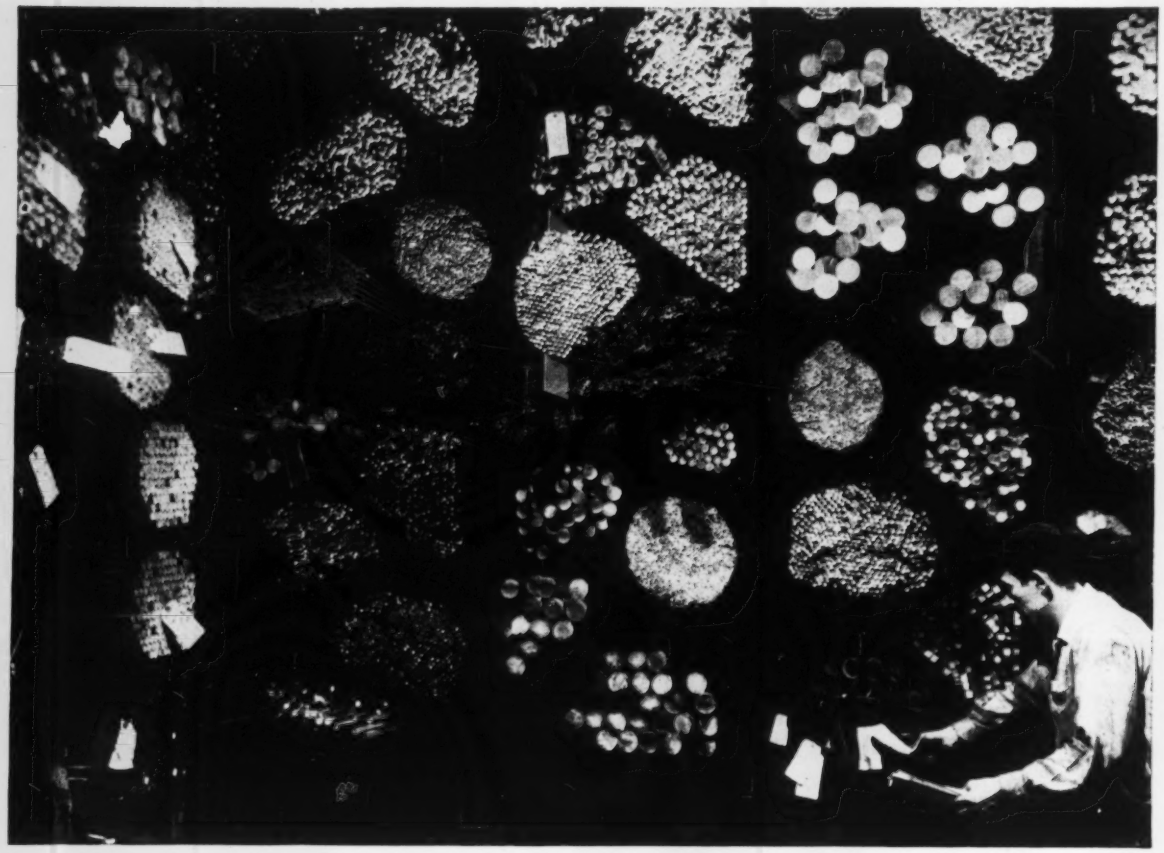
Sales-Engineering Offices in Detroit, New York, Chicago and Los Angeles

Engineers and Manufacturers of Complete Conveyorized Finishing Systems: Metal Parts Washers, Metal Cleaning and Rust Proofing Machines, Conveyorized Cleaning and Pickling Machines; Dry-Off Ovens, Spray Booths, Electrostatic Spray Enclosures, Flow Coaters, Dip Coaters, Finish Baking Ovens, and Paint Stripping Equipment; Core Ovens, Soldering Ovens, Dehydrating Ovens, Heat Treating and Quenching Equipment for Aluminum and Magnesium; Dust and Fume Control Installations, and Many Other Units of Special Plant and Production Processing Equipment.

See Sweet's Plant Engineering File for Information and Representative Installations, or Write for Catalogue A-659

MAHON

OUTLOOK MET
METALWORKIN



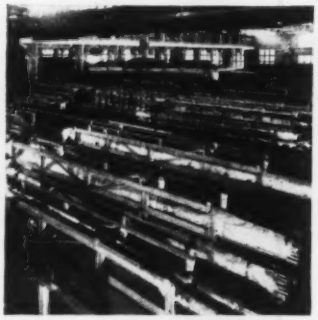
3-Point Check List

FOR USERS OF COLD FINISHED BARS

☑ ***SIZE RANGE.*** Size ranges on hand at Ryerson are second to none, even including hard-to-get intermediate sizes. Shafting . . . screw machine steel . . . accuracy stock . . . machinery steel—every type of cold finished bar awaits your call.

☑ ***Know-How.*** Every day Ryerson steel men—*specialists* in cold finished bars—are in touch with machining problems . . . latest techniques. This unequaled fund of experience is ready to serve you in selecting a steel that gives faster machining to closer tolerances . . . better finish.

☑ ***Reliability.*** Year in and year out your most reliable source for cold finished bars is Ryerson. Call today. Prompt, personal service from experienced steel men proves that Ryerson service saves you time and money on your order for a few bars—or a truckload.



Widest size range always on hand, even including hard-to-get intermediate sizes.

Shafting stock receives special care to insure protection of finish and straightness.

RYERSON STEEL®

Joseph T. Ryerson & Son, Inc., Member of the NLAN Steel Family

STEEL • ALUMINUM • PLASTICS • METALWORKING MACHINERY

NATION'S MOST COMPLETE SERVICE CENTERS IN PRINCIPAL CITIES COAST TO COAST

Can Cross Kick Out the UAW?

On Oct. 15, a federal appeals court in Cincinnati will hear a Cross Co. petition which seeks to depose the United Auto Workers as bargaining agent for the company's employees. When the first union contract expired last October, the UAW won an employee election by 16 votes. Based on employee affadavits, the Detroit builder of special machines refused to bargain. In June, the UAW won a strike vote in what the company and some employees charge was a rigged election. Pickets collected suddenly on Aug. 4; some violence ensued. Now 50 of the firm's 265 workers are holed up inside the plant which is operating at about 35 per cent of its prestrike rate. Ralph Cross, executive vice president, declares he'll fight all the way to the U. S. Supreme Court to keep the union out. The UAW, which battled for 12 years to organize the company, is equally determined to stay.

Why Rail Unions Don't Want Featherbedding Studied

Railroad management asked President Eisenhower to appoint a special study commission to look into featherbedding in their industry. Rail union chieftains oppose such a move. They are afraid of a study group because of a like experience in Canada, where a royal commission recommended the removal of firemen from yard diesels and freight service because there is no longer any need for them.

Kearns Sees Pickup in Exports

Assistant Secretary of Commerce Henry Kearns believes U. S. export sales have touched bottom and will rise the rest of the year. Preliminary figures for July show exports totaled $1.47 billion for the month—up $50 million from July, 1958. "I believe the increase will be a little more pronounced during the rest of the year," Mr. Kearns adds (Page 52).

Watch the Urban Transit Field for Sales Potential

City planners may revitalize the market for urban transit equipment and develop some astounding new markets for metalworking. Monorail systems are an example. (Page 58).

World Steel Output: A Record

During the first half, world steel production soared to a record annual rate of 346 million tons (vs. 289 million last year), the Commerce Department reports. The figures don't include output in Communist China and North Korea. Here's how major countries fared compared with last year: U. S.—

up 26.5 million tons to 64.3 million tons; Russia—up 2.5 million tons to 32.3 million; Japan—up 1.8 million to 8.27 million; Canada—up 398,000 to 2,819,000; West Germany—down 11,000 to 14,975,000; France—down 62,000 to 8,246,000; Benelux—up 262,000 to 6,193,000; Italy—down 80,000 to 3,468,000; United Kingdom—down 969,000 to 10,820,000.

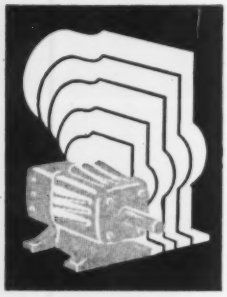
It Pays to Keep Employees Informed

You probably won't want to give your employees a map on how to get through the building like the little fellow on the right was given. But it's mighty important that you keep them informed. Witness the case of Pitney-Bowes Inc., Stamford, Conn. After seven years of better communications, its productivity rose 40 per cent, profits nearly tripled, dividends more than doubled, average annual income of employees jumped $2061. For tips, see Page 48.

Machine Tools Get Boost from Abroad

Foreign orders for metal cutting and metal forming machine tools totaled $10,050,000 in July—the biggest monthly influx since October, 1956. Foreign orders for metal cutting types reached $5,050,000—second highest monthly total this year. The big gain came in metal forming types: July's foreign orders soared to $5 million for the biggest month on record (National Machine Tool Builders' Association has reported orders on the current basis since January, 1956). July domestic orders for all machine tools totaled $53.4 million—down $6.7 million from June, but the second best month in two years.

Drives Get Smaller, Carry Bigger Loads



Users of mechanical drives, watch these trends: Size reduction for better space usage, shaft mounted reducers, new standards (coming soon from the American Gear Manufacturers Association). Metalworking is demanding more horsepower through smaller mechanical drive units. They're getting that with high precision gears. It saves materials, time, testing, and maintenance. And sometimes, a new drive can make an old machine competitive with a new one (Page 90).

1958: Industry's Safest Year

While industry set few records last year, it did chalk up one important one: 6.17 disabling injuries per million manhours worked. That's 2 per cent less than in 1957 and only the fourth time in history that the rate fell below 7, reports the National Safety Council. The communications industry led the field with 0.97; electrical equipment was second with 1.76; aircraft manufacturing placed third at 2.18. Industrial employees lost 744 days due to injury for every million manhours worked.

America's Savings: $1,721,800,000,000

That figure—$1.7 trillion—represents the total financial assets of the American people at the beginning of this year. About $425 billion is in corporate stocks. That's the latest report in the Federal Reserve Board's continuing study of where funds come from and where they go.

Switch to Powder Metal for Six Parts Crops Costs . . .

That's how much Goss Div., Miehle-Goss-Dexter Inc., saved when it switched to powdered metal for six parts. It cuts the company's material costs for those parts by $13,017 annually. Key: A watchful planning department (Page 92).

62%

Consumers on a Buying Spree

Consumer instalment credit in July increased by a seasonally adjusted $500 million, the Federal Reserve Board reports. That's the largest monthly hike since September, 1955. It boosted the total outstanding to a record $36.4 billion. Auto credit rose $227 million in July—the most for any month this year.

What Are Aluminum's Newest and Biggest Markets?

Handling liquefied methane gas is termed "the largest single prospective new use for aluminum to come to the attention of the industry in years," by W. B. Moore, director of chemical and petroleum market sales, Reynolds Metals Co. Probably the newest use for aluminum is in do-it-yourself Christmas trees that are fireproof and last a lifetime. They're made by Star Band Co., Portsmouth, Va., and Aluminum Specialty Co., Manitowoc, Wis.

Testing & Inspection Equipment Makers Are Busy

This harried but happy little guy represents the nation's producers of testing and inspection equipment. They're feeling one of the biggest order booms in history. This year's sales will probably exceed last year's by 20 per cent. The second half will be substantially better than the first. Reason: Metalworking companies, with renewed emphasis on quality, are coming strongly back into the market (Page 55).

Michigan Aims at Fiscal Stability—at Business' Expense

Michigan businessmen will have to kick in an extra $8.5 million a year in taxes as a result of bills signed last week by Democratic Governor G. Mennen Williams. Another bill boosts the sales tax from 2 to 3 cents, but it's being challenged constitutionally in a test case. Michigan ran out of money this

spring and has been letting unpaid bills pile up ever since. The new taxes are expected to add $120 million to the state's annual revenue.

Why Titanium Maker Changes into Civvies

"Our long range objective is to make titanium as well known to the buying public as steel and aluminum. We intend to explore and exploit every market potential for these goals which looks even faintly feasible." The speaker is Frank H. Vandenburgh, president, Mallory-Sharon Metals Corp., Niles, Ohio. His firm will operate at about 17 per cent of capacity this year. But instead of backing out of the field, it is raising its sights and planning new commercial and industrial uses (Page 113).

Education Grants Climbed During Recession

Corporations gave 23.5 per cent more dollars to aid education during 1958 than during 1956. That's what the Council for Financial Aid to Education reported last week. Almost twice as many companies gave $100,000 or more in '58 than in '56. And nearly twice as many firms contributed at the rate of 1 per cent or more of their before tax net income. Education received 28.4 per cent of the corporate gift dollar last year, the council reports. Here's the percentage of income before taxes given to education by the average company in several industries: All manufacturing—0.30; electrical machinery—0.36; fabricated metal products—0.30; chemicals—0.47; mining —0.48; primary metals—0.55; transportation equipment—0.62.

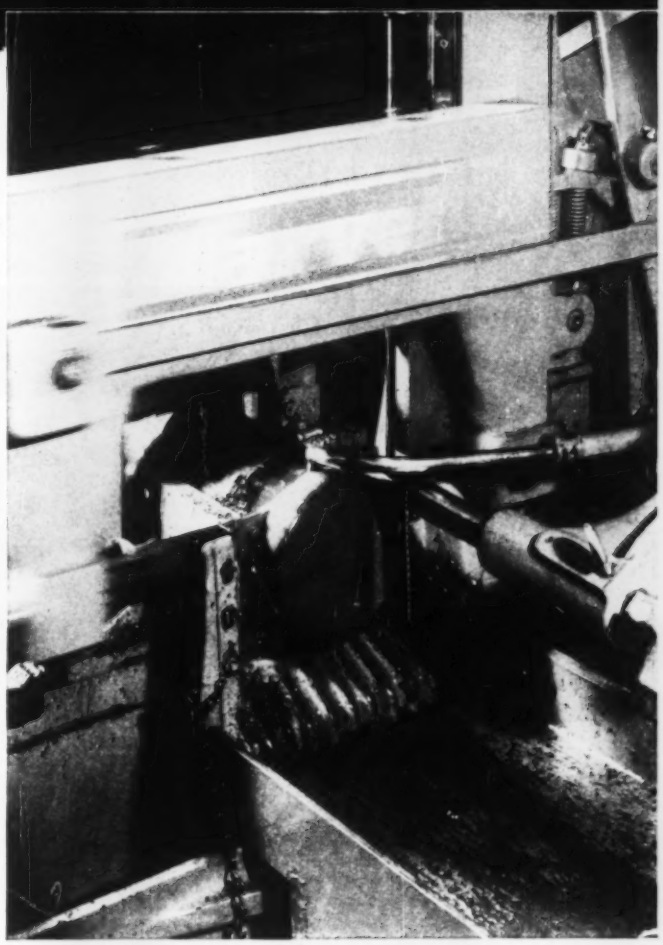
Accent on Miniaturization

If you find a way to make an item substantially smaller, chances are you can crash into an astonishing growth field—miniaturization. Dietrich A. Jenny, head of RCA's exploratory research, forecasts radios the size of sugar cubes, TV receivers slightly larger, complicated computers that will fit on your desk, and space ship devices with 100 million parts crammed into 1 cu ft.

Straws in the Wind

Leading New York bankers think another rise in business borrowing costs is imminent . . . Railroad industry officials and chiefs of nonoperating rail unions will meet this week to set a time to start negotiations on new union wage demands . . . Unit sales of imported trucks will continue to rise (perhaps to 50,000 units in '60 vs. 35,000 this year), but their share of the market will tend to hold steady as total truck sales climb, H. P. Sattler, Chevrolet Div.'s assistant general sales manager told STEEL . . . Aluminum Co. of Canada Ltd. will halt production of magnesium; Dow Chemical Co. will supply the firm with magnesium in exchange for aluminum . . . A new Pitney-Bowes facing and canceling machine will be installed in major post offices; with it, six men can process 27,000 letters an hour vs. 16,000 by ten men under the old system . . . Half the country's franchised car dealers now sell imports, says Lee Fleet Management Inc., Cleveland . . . Chrysler Corp. says it can build cars into November with the steel it has on hand, but supplier shortages may pose problems earlier (see Page 111).

5 Basic Reasons why MARVEL HACK SAWS CUT-OFF MORE ACCURATELY...



The consistently accurate performance of MARVEL Heavy Duty Hack Saws is no accident. MARVEL engineers knew, many years ago, that to produce and maintain accurate cutting-off, a hack saw must be designed and built like a fine machine tool.

Some of the basic design principles built into the modern MARVEL Hack Sawing System that makes it the most accurate cutting-off method you can use are:

1. V-Way Design...Greater Rigidity

Upright and Saddle are precision machined and fitted to form a rigid, integral unit capable of withstanding any cutting load with no deflection or side movement.

2. Anti-Friction Bearing Construction

Anti-friction ball or roller bearings are used at all load carrying points. Even the strongly braced saw frame reciprocates on heavy duty, fully enclosed preloaded ball bearings which provide permanent, frictionless rigidity and true-running, straight line cutting strokes.

3. Minimum Blade Frame Reach

Close-coupled design and crank lever action of MARVEL Saws keeps the saw frame and blade reach very short in relation to the vertical V-ways on which the unit is mounted. This insures optimum rigidity, even under the most severe operating conditions.

4. Positive Relief Blade Lift

On the return stroke, positive relief lift raises the blade to provide proper and "cushioned" lead-in on the next cutting stroke. This prolongs blade sharpness, life and accuracy.

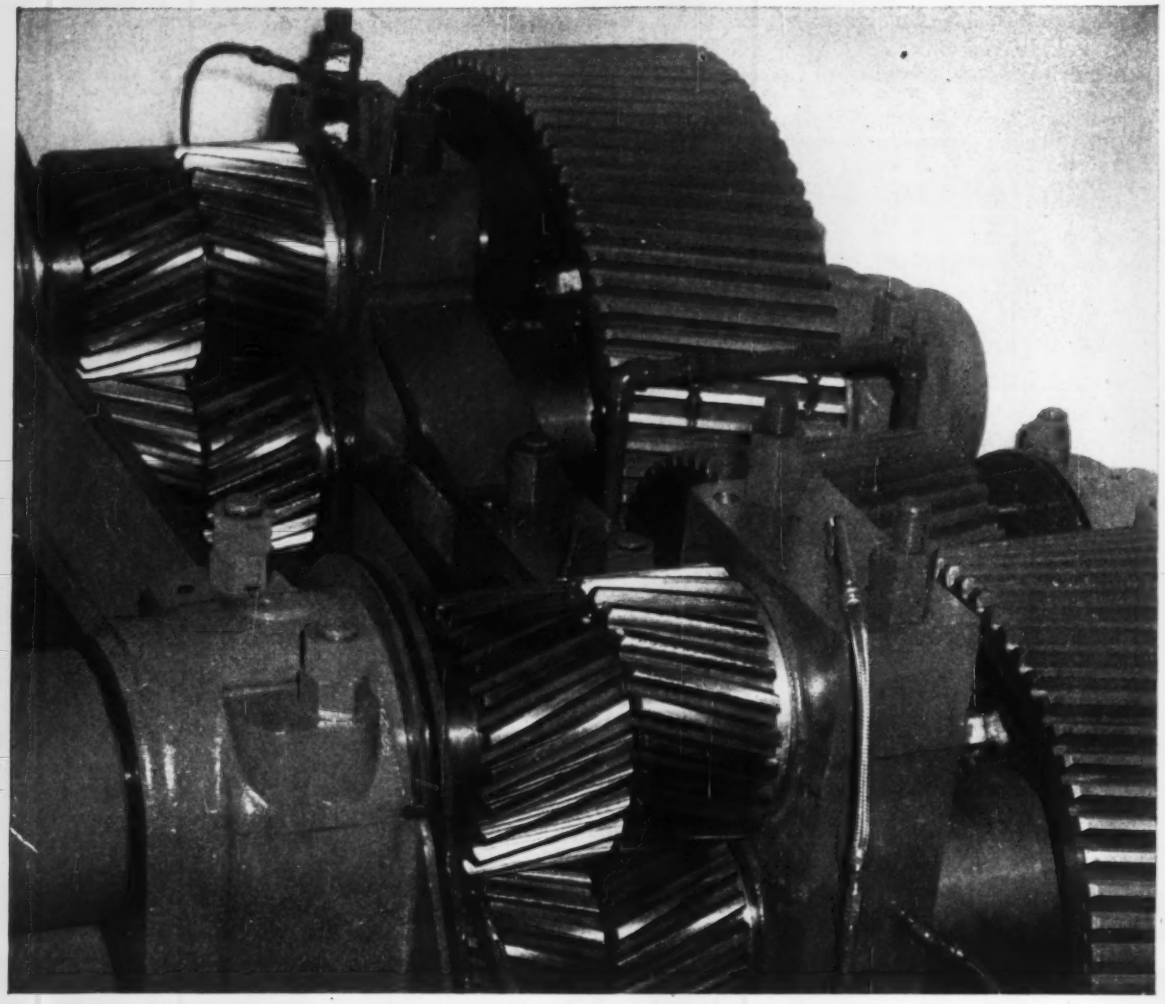
5. Rigid Cutting Tool

Cutting-off accuracy requires a rigidly held, relatively short cutting tool. MARVEL Unbreakable High-Speed-Edge Hack Saw Blades, which combine a narrow high speed steel cutting edge permanently welded to a tough alloy steel body, can be tensioned from 200% to 300% more taut than ordinary blades. This provides a most rigid cutting edge.

Write for the MARVEL Catalog and the complete story on MARVEL METAL CUTTING SAWS

MARVEL Metal Cutting SAWS
Better Machines-Better Blades

ARMSTRONG-BLUM MFG. CO.
5700 W. BLOOMINGDALE AVE., CHICAGO 39, ILL.



Rolling mill pinions of Type 4620 nickel-molybdenum steel have a good hard case (500/550 Brinell) plus toughness, stand up to severe overloads. Made by Morgan Construction Company, Worcester, Mass.

4620 Nickel alloy steel gives them 4 times longer service

Hardened rolling mill pinions in an Eastern steel plant were not giving satisfactory service, due to continuous overloading. They just weren't tough enough to take the beating of heavy rolling.

Designers solved the problem – called for pinions of 4620 nickel-moly carburized steel ground after hardening. Now they've got a good case – pinions don't crack . . . tough cores support them.

This case stood up – the 4620 nickel alloy steel pinions have served over *4 times longer* than the old through-hardened pinions . . . and are still going strong.

This high-performance pinion was *not* difficult to make. It was rough-machined at a hardness of 187/220 Brinell; showed little distortion through carburizing and hardening. Only 0.005" was needed for finish grinding, after hardening to 500/550 Brinell.

Parts that take a beating in heavy equipment must also have practical service life – you get both in nickel alloy materials.

For practical information on 4620 nickel alloy steel and its application to your specific metal problems, write Inco's Development and Research Division.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street INCO New York 5, N. Y.

INCO NICKEL
NICKEL ALLOYS PERFORM BETTER LONGER

Will You Be Late?

We recently wrote to a large number of capital equipment manufacturers asking their help in spotting metalworking companies that have done outstanding jobs in modernizing plants to obtain greater productive efficiency.

Many equipment makers cited examples of customers who have put a new edge on their operations with better equipment. This we expected.

But a substantial number of builders said they regretted that they couldn't help us. Consider these comments:

". . . It is a sad commentary on the state of U. S. productive industry that we are unable to give you the name of a single customer who in the recent past has done an outstanding job in modernizing capital equipment."

". . . Frankly, the situation is a rather sorry one. Any major builder should be in a position to name many customers who have done or are doing a good equipment modernization job. But it just can't be done."

". . . We know of no company that has modernized its production line in this area recently."

Expectations that we are heading into a high level, although extremely competitive, economy in the early 1960s are so widespread as to be almost universal. It is axiomatic that metalworking companies have to be equipped for optimum efficiency to get their fair share of an expanding market.

While capital equipment makers are experiencing a good upturn, their recovery from the 1958 recession still trails that of consumer goods makers. Most equipment builders are operating at one-half to two-thirds of capacity and are fighting for orders.

How long will this condition—favorable to buyers—continue? Judging from the trends, it should not be many months until equipment builders' backlogs fill up, deliveries become extended, and buying terms become less favorable. If history repeats, the upswing will touch off a rush of orders, and buyers will be unable to get the equipment they need on time.

We all have seen it happen before.

Will you be late?

Walter J. Campbell

EDITOR

Building Today, with an Eye to Tomorrow

MEETING *of* MINDS!

Each of these men has an expert mind in his field—administrative, sales, finance, raw materials, production. Each contributes years of practical experience, rigorous theoretical knowledge and proven executive ability. Together they constitute Inland Steel Company's Products and Facilities Planning Committee—keeping a watchful eye on consumer and industrial trends and requirements, guiding the company's development and expansion.

To their attention are brought market studies, design forecasts, new product possibilities, material resource potentials, new production methods, future equipment needs. They are excellent listeners, they travel often to see for themselves, and they are doers—initiating programs which have upped Inland's steelmaking capacity 15% to 6,500,000 ingot tons in just three short years.

The work of this committee, like the future of America's expanding economy, is never ending. Keeping pace with midwest industrial growth, Inland completes each stage in its expansion plan and looks ahead . . . for the next job.

INLAND

INLAND STEEL COMPANY

30 West Monroe Street • Chicago 3, Illinois

Sales Offices: Chicago • Davenport • Detroit • Houston • Indianapolis
Kansas City • Milwaukee • New York • St. Louis • St. Paul

Other Members of the Inland Family
JOSEPH T. RYERSON & SON, INC.
INLAND STEEL PRODUCTS COMPANY
INLAND STEEL CONTAINER COMPANY*
INLAND LIME & STONE COMPANY* *Division

Most Partmakers Won't Be Hurt By Strike Until October

EVEN THOUGH the steel strike is nearly eight weeks old, component buyers should have no major inventory problems before Oct. 1. And 40 per cent of the respondents to a special STEEL survey will be in good shape until mid-October.

The findings were substantiated by a spotcheck of component producers. They anticipate few difficulties before next month. The big problems may develop after the strike as buyers attempt to rebuild depleted stocks to meet an expected fourth quarter surge.

• **Parallels** — So metalworking, in general, has or will have inventories of components which are as good as its inventories of raw steel. In the early days of the steel strike, some purchasing agents thought that their high stocks of the ferrous metal would do them little good if the components they needed became scarce. Although spot cases of imbalance will be turning up, both component and raw steel inventories should have about the same life expectancy.

As a result of the steel and copper strikes, 74 per cent of those reporting presently feel little or no effect. Only 5 per cent have real problems. Stocks were said to be 30 days or more above normal by 65 per cent of the purchasing agents. Only 5 per cent were supplied for less than 20 days over the normal inventory level.

• **Few Imminent Shortages**—Nearly four-fifths of the buyers don't expect shortages to interrupt operations, at least not until October. About 22 per cent foresaw curtailments in the near future. Nominated for the upcoming shortage list: Bearings, electrical equipment,

Is the steel or copper strike hurting your supplies and deliveries? (% of Respondents)

40%—Not at all

34%—Slightly

21%—Moderately

5%—Excessively

If the strike ends by Oct. 1, do you expect a shortage of parts will seriously curtail any of your operations?

78%—say no

22%—say yes

If you stockpiled for the strike, how many days over normal is your inventory now?

0-10 days	10-20 days	20-30 days	30-40 days	40-50 days	Over 50 days
2%	3%	30%	11%	14%	40%

Strike Losses

(through Sept. 7)

Lost Steelworker Wages

---------- $562,000,000

Lost Sales

---------- $1,638,000,000

Lost Production (ingot tons)

---------- 15,570,500

Other Losses

Overhead, depreciation, and salaries of nonproduction workers in steel.

---------- $312,000,000

Tax Losses to U. S.

---------- $360,000,000

pipe and steel plates.

About 42 per cent of the purchasing agents indicated delivery problems with at least one item. In July, 41 per cent were complaining. Most frequently mentioned were bearings, electrical goods, and castings.

At the same time, 11 per cent revealed overstocks. Said one buyer: "We are loaded to the rafters and have some dead stock we can trade." Although not yet of significant proportions, some stock shifting from firm to firm has taken place. It may be whistling in the dark, but another respondent claimed he would have been in worse shape (with overstocks) if there had been no strike.

• **Why So High?** — Component buyers have done a good job of stockpiling for the strikes. In fact, 25 per cent admit their inventories are higher than they expected them to be at this time. Only 13 per cent said they were lower.

Spot shortages have popped up here and there, frequently due to a delay in locating common steel items. But component producers see no imminent problem in keeping their customers supplied. They're not too worried about other raw materials. "Pig iron supplies should last through October, and possibly November," said a castings executive. If the strike lasts another 30 days, problems will start to develop. "We're more worried about cancellations because of a small part shortage stopping our customer's production than we are about our inability to fill an order," concluded another castings executive.

Strike Heads for Record

The steel strike is 55 days old on Labor Day, equaling the record for the longest postwar walkout in the industry. The other marathon ran from June 2 through July 26, 1952.

What the present strike has cost (55 days): Nearly $2.9 billion has been lost directly in steelworkers' wages, industry sales, taxes, and other expenses. Add the indirect losses to railroads and other industries, and the figure could approach $5 billion.

• **Mid-September End?**—The Labor Department seems to mark mid-September as the point when pressure would prompt the use of a Taft-Hartley injuction to stop the walkout. The department issued its second report on the impact of the dispute—covering the first half of August. Effects were slight in that period, with little change expected immediately.

"However," the department adds, "shortages of specialty steel items may bring a rise in layoffs if the strike continues to mid-September."

• **Hardships Among Strikers?** — While financial pressure mounts on the steelworkers, it's not yet severe enough to push United Steelworker President Dave McDonald into a settlement. Some of the pressure is off most of the 28,000 strikers in New York state. It's the only major industrial state which allows jobless compensation to strikers. But even there, the law permits payments only after a seven week disqualification period. The New York steelworkers will get about $1 million a week, four-fifths of it going to the Buffalo area.

Mr. McDonald is still trying for a package that he claims will cost 15 cents per man per hour. The industry says the expense will be higher—at least 20 cents. Management's stand remains: No net increase in employment costs.

• **Company Position**—The industry would agree to sign a two-year pact providing an increase in pension and insurance benefits this year and a modest boost in wages next year if the union co-operates with it in:

1. Improving the language and spirit of the labor agreements to reduce causes of misunderstanding and friction.
2. Discouraging wildcat strikes.
3. Dropping the cost-of-living clause in the 1956 pact (but all the 17 cents an hour added to wage rates under the clause since 1956 would be retained).

Last Wednesday, the top negotiators met for the first time after a five-day respite. Indications are the two sides are at last making progress toward a settlement.

Most Aug. 31 Deadlines Extended; Fabricators Face Strike Threat

THIRTEEN United Steelworker contracts with steel producers expired last Monday (see table below). Only one was not extended—Kidd Works, Vulcan-Kidd Div., H. K. Porter Company Inc., Aliquippa, Pa. (annual ingot capacity: 9600 tons). The company's Vulcan Works was struck Aug. 15. The contract at Lone Star Steel Co., Dallas, expires today. At press time, no agreement had been reached. Some 60 basic steel firms, accounting for about 15 per cent of total ingot capacity, still operate.

The USW may spread the strike to fabricators and warehouses outside basic steel. Several walkouts occurred last week. Six Joseph T. Ryerson & Son Inc. warehouses, representing over 10 per cent of the firm's steel sales, were struck. E. W. Bliss Co.'s Canton, Ohio, plant was struck. Workers at its Pittsburgh and Midland, Pa., plants have been idle since Aug. 1. Brief strikes also hit several other Ohio fabricating plants. Many fabricators won extensions of 30 days beyond a big steel settlement.

In Pennsylvania, Beryllium Corp., Reading, agreed to a three year contract with a cash package of 34 cents an hour and increased fringe benefits. National-United States Radiator Corp., Johnstown, reached a three year agreement calling for pay increases totaling 21 cents an hour, plus added fringes.

Steel Producer	Location	Annual Tonnage	Contract Expiration or Other Terms (Sept. 2)
A. M. Byers Co.	Ambridge, Pa.	90,000	Contract extended to Sept. 30
Baldwin-Lima-Hamilton Corp.	Burnham, Pa.	188,710	Big steel settlement plus 30 days
Copperweld Steel Co.	Warren, Ohio	660,000	Big steel settlement plus 30 days
Edgewater Steel Co.	Oakmont, Pa.	117,600	Big steel settlement plus 30 days
Empire-Reeves Steel Corp.	Mansfield, Ohio	500,000	Big steel settlement plus 30 days
Erie Forge & Steel Co.	Erie, Pa.	284,000	Big steel settlement plus 30 days or Nov. 1, whichever is earlier
Heppenstall Co.	Pittsburgh	55,550	Extended to Sept. 30
Industrial Forge & Steel Inc.	Canton, Ohio	84,000	Big steel settlement plus 30 days
Laclede Steel Co.	St. Louis	600,000	Big steel settlement plus 30 days
H. K. Porter Company Inc.	Birmingham	115,000	Big steel settlement plus 30 days
H. K. Porter Company Inc.	Aliquippa, Pa.	9,600	Struck
Simonds Saw & Steel Co.	Lockport, N. Y.	21,600	Extended to Sept. 30
Southern Electric Steel Co.	Birmingham	66,000	Extended to Sept. 30 on wage rates. Contract on other issues expires 8/31/60

LeTourneau Broadens Line

R. G. LeTourneau Inc., Longview, Tex., is offering products from its steel division on the open market. Increased production, designed to further diversify the firm's product line, permitted the move. Previously, output from LeTourneau's 300-ton-per-day mill went to the company's manufacturing facilities at Longview and Vicksburg, Miss.

Biggest benefit will be to southern industry. It'll be able to buy additional quantities of high quality steel plates, frequently in short supply due to demands in other geographic areas.

GSA Plans to Sell Surplus Titanium

WITHIN 45 days, General Services Administration will offer 35,073 lb of titanium sponge for sale. It has a Brinell hardness of 170 or above and will be offered in one lot, f.o.b. Boulder City, Nev. (the site of the Bureau of Mines pilot sponge plant).

Sources in Washington are viewing the sale with mixed feelings. Sponge of that quality is described as merely a substitute for scrap. There is no U. S. market for it, says a Commerce Department official. But GSA may be able to sell it overseas at 40 to 50 cents a pound. No sponge of that quality is produced in the U. S. except by mistake, he says. "The sale won't affect normal sponge purchases."

On Capitol Hill, the sale is viewed with alarm because it may be a first step toward disposal of other qualities of sponge held in Uncle Sam's Defense Production Act surplus stockpile. Says a spokesman for Sen. Allen Bible (D., Nev.): GSA has considered selling about 34,000 lb of titanium sponge with a Brinell of 140 to 170. Two other government agencies confirm that statement. One has complained strenuously enough to hold up that sale. An official told STEEL: "They'll sell that over my dead body." Quality in this instance is good for a number of alloys.

Most sponge produced in this country has a Brinell of about 100 to 120. Last year, 9.2 billion lb were produced. We are also importing sponge from Japan (Brinell, about 100). It's going to the DPA stockpile, while the domestic industry is running at about 25 per cent of capacity.

Crux: A sale of 35,000 lb, or another sale of 34,000 lb, doesn't mean much to producers today, but Senator Bible has warned the Senate Interior & Insular Affairs Committee that government officials are definitely considering the sale of up to 5 million lb of surplus sponge. He sees the initial GSA sale as a signal. The material in the stockpile is probably worth about $1.50 a pound on the average.

GSA admits: "The whole titanium inventory is under active study."

Where's Plastics' Place in Tooling?

W. R. Weaver, president, Modern Pattern & Plastics Inc., Toledo, Ohio, takes a hard look at plastic tooling and its place in the industry. He believes those who don't may be missing a good bet. There's a lot of work to be done by plastics people—setting standards, educating consumers, and improving materials, techniques, and job evaluation. Nevertheless, Mr. Weaver sees a bright future for plastic tooling and emphasizes its many advantages in various applications.

Modern, a pioneer in the plastic tooling field, expects a 400 per cent boost in 1959 business over 1952 levels.

"IF A RESIN MATERIAL is developed which would make plastic production dies and molds a reality, plastics would account for 50 per cent of all tooling," states W. R. Weaver, president, Modern Pattern & Plastics Inc., Toledo, Ohio. "Even without such an improvement," says Mr. Weaver, "I expect the plastic tooling market to increase 500 per cent within ten years. The greatest growth will be in geographical areas where plastics are not yet used." Plastics now account for 2 to 3 per cent of the tooling market, he believes. Largest users are found in the West Coast and Detroit areas and in the airplane industry.

Mr. Weaver continues: "Complexity of shape, shrinking construction time, and foreign competition are demanding a change in our thinking. The industry's biggest problem is educating the consumer, admitting plastics' shortcomings, yet striving for improved materials, techniques, and job evaluation. Techniques vary widely. However, the Society of the Plastics Industry and the American Society of Tool Engineers are attempting to set up manufacturing and test standards." He concedes plastics are not a "cure-all" but emphasizes they are a solution to some tooling problems.

• Modern Pattern & Plastics, a 47 year old pattern firm, entered the plastics field in 1951.

The company helped pioneer metal fiber and high temperature resin techniques and the surface cast epoxy and metal cast core method for draw dies and foundry patterns. It did the initial work on preproduction molds for the Chevrolet Corvette's all-plastic body. A recent Modern development is a metal fiber spray gun which makes a hard plastic faced plaster by bonding plaster to plastic. Metal fiber and epoxy resin laminates are also produced with the gun. Other applications are under study.

The firm expects its 1959 plastic tooling business to be 400 per cent above 1952 levels. Another 300 per cent improvement is foreseen within ten years. Its present goal is a completely integrated facility where prototype and production programs can be engineered, using wood, plaster, plastics, and conventional tooling methods. Lack of sufficiently trained manpower is a growth obstacle. The company employs some 50 wood and metal patternmakers and plastic tool and diemakers.

Mr. Weaver evaluates the plastic tooling industry and its future:

• The foundry field, where plastics have been used for five years, will provide the biggest growth potential.

Reason: Less improvement of present materials is needed to meet foundry requirements. Resins can reproduce present shapes, cutting costs. In the last two years, improved bulk casting resins and simplified techniques have made pattern manufacture and reproduction easier. Plastic slugs (reverse casts from a completed half corebox) offer increased wear over their plaster counterparts for spotting in core dryers. Plastic patterns have the reputation of being subject to more damage than metal types, but abuse rather than sand wear is the cause, Mr. Weaver contends.

Low volume investment molds have been used for some time, although relatively poor heat conduction has kept them from production applications. Work with high heat resins impregnated with metal fibers shows promise of correcting the problem. Heat transfer through metal fibers is 30 times more effective than it is through unfilled plastic materials. Such resins are also being tried in shell molding applications with the aim of reducing costs.

Plastic patterns for plaster proc-

ess casting are excellent for production work and cut costs as well. Cast turbine blades in torque converter castings utilize plastic corebboxes almost exclusively. But resins with higher heat distortion properties and heat transfer at least comparable to iron are needed to make plastics a universal material for foundry applications. A reduced thermal coefficient of expansion would also be desirable.

• Use with sheet metal has been limited to development and prototype production.

Applications: Draw and stretch dies, hammer blocks, die model duplication, checking fixtures, fixturing, templates, Keller models, spotting forms, and miscellaneous tooling aids.

Dies of 100 per cent plastic are not suitable for runs over several hundred parts. (Exception: Some ideally designed sheet panels.) Production runs of over 50,000 have been recorded on dies made with metal inserts, metal fibers, and Fiberglas impregnated epoxy. The most recent development to improve die wear is spray metal and molecular deposition of nickel and iron, using plastic as a backup structure. Excessively small draw radiuses and sharp corners are the prime reasons for plastic failure. Use of heat transfer compounds appears promising, especially with hot forming up to 600° F.

Plastic can be cheaply formed when cast or laminated against shapes, virtually eliminating machining and polishing. It can be fabricated quickly and easily modified or reworked. Biggest limitation in sheet metal work: Relatively low physical properties.

• Plastic molds have been used for more than ten years for the production of boat, airplane, and automotive components and numerous other parts but are limited to low volume production for molding plastic parts.

Even if plastic molds could produce high volume runs, metal molds, with good heat transfer, would still maintain a better production cycle.

Pouring molds for polyurethane foams are widely used, particularly in the automotive field.

Compression and ejection molding are still in the experimental stage. Higher temperature and improved heat transfer resins are being tested for laminated use.

Problems: Surface finish and mold release.

Adds Mr. Weaver: "Recent tests at our plant convince us that plastics will be applicable for low volume explosive forming type tools."

Illinois Tops in Machinery

Illinois leads the nation in the manufacture of machinery and fabricated metal products, shows a study of industry groups by the Illinois Manufacturers' Association.

Based on 1957 statistics compiled by the U. S. Department of Commerce, the study shows three industry groups exceeding the billion dollar mark in value added by manufacture: Machinery, $3.53 billion; food and kindred products $1.59 billion; and fabricated metal products $1.21 billion.

Since 1954, value added by manufacture has grown about 24 per cent in machinery, 23 per cent in fabricated metal products, and 16 per cent in food and kindred products.

New Univac Computer Bows

The Univac Solid State, introduced in Pittsburgh by Remington Rand Univac Div. of Sperry Rand Corp., is said to be the first commercially available computer system in the U. S. using solid devices such as transistors, Ferractor amplifiers, and magnetic cores.

The computer consists of a central processor, card reader, read-punch unit, and printer. In 1 minute, the machine can read 450 cards and print 600 lines. Memory storage capacity is 50,000 characters of information, allowing the user to complete problems in one run. Data do not have to be processed by application. Production, inventory, sales, and billing information can be co-ordinated into a single processing procedure.

Because it lacks vacuum tubes, the computer requires less power and space than its predecessors. The Ferractor amplifier, invented by Remington Rand Univac, is no larger than a pencil tip eraser, yet performs accurately from 60° F below to 220° F above zero.

THIS QUALITY CONTROL SETUP is used to check electrical operations in Mercury steering columns. Walter Shoemaker spends a lot of time behind the wheel, but he never turns a corner or has to look for a parking space. A panel of eight lights on the test stand shows him if all the connections have been properly installed

Here's How Companies Evaluate Communications Media

MEDIUM	TYPE	STRENGTHS	WEAKNESSES	REMARKS
Grapevine	Oral	Personal. Of, by, and for the employees.	Often inaccurate. Does not reach everyone.	Thrives when other channels are closed.
Public Address System	Oral	Fast. Reaches all workers at once.	Impersonal. One-way. Good only for short messages.	Can be helpful. Not a basic medium.
Meetings	Oral	Face to face. Fast. Potential morale builder.	Often one-way. Hard to run well.	Basic and universally used. Can go over big or flop.
Attitude Survey	Oral and written	Gets ideas up. Potential morale builder.	May boomerang if not followed up.	Of great value in many situations.
Interview	Oral	"Natural," two-way. Personal.	May be hard to train good interviewers.	Can be used for wide range of employee problem areas.
Telephone	Oral	Convenient, fast. Two-way.	Not face to face.	Indispensable.

Source: National Industrial Conference Board, based on company experience

Communication Aids Labor Relations

SUPPOSE that you question Joe Zipotas, who has worked for your firm for the last 25 years, on what he knows about the company.

You find that he doesn't know: The year the company was founded; the number of plants; more than two of the company's 200 products; the name of the man who has been president for three years; the location of headquarters; the source of a single raw material; either the plant operation which precedes his or that which follows his, except in a general way; what free enterprise is (he didn't recognize the phrase).

You find that he does know: His union's name and number of his local; names of two columnists on his union paper; names of 3 out of 5 of his union's officers; four direct benefits which the union had secured for him (actually the union secured two of them and a third was a compromise); an acceptable definition of collective bargaining ("it's what the union uses to get things for the workingman").

Joe's name has been changed, but Joe is a real person. His case was reported by Newcomb & Sammons, Chicago management consultants, and published by the Business Relations Department, Chamber of Commerce of the United States. And, while Joe's case is an extreme one, it points up a growing concern of management; the concern that employees' information and understanding may have a direct bearing on the company's continued success.

MEDIUM	TYPE	STRENGTHS	WEAKNESSES	REMARKS
Open House	Largely oral	Face to face. Potential morale builder.	Gives only a superficial view of the company.	Can promote renewed intracompany communication.
Union Activities	Largely oral	Personal. Fundamental to employees.	Activities seldom reach all employees.	Value depends on leadership of union, relations with management.
Suggestion System	Written	Gets ideas and gripes up. Voluntary.	Most ideas rejected. Slow. Used by few employees.	If other media are lacking, ideas (and gripes) go up.
Bulletin Board	Written	Official. Convenient.	Impersonal. One-way.	Real but limited function to perform. Many are in use.
Employee Booklet	Written	Official. Convenient. Comprehensive.	Impersonal. One-way. Needs frequent revision.	A chief medium for telling workers (especially new ones) about the company.
House Organ	Written	Wide, current coverage.	Mostly one-way. Contents often trivial.	Usually not the effective communicator it could be.

• More businessmen today recognize that an informed employee feels more secure and is a better employee because he is more interested in his work, more loyal to the firm, and more productive.

Pitney-Bowes Inc., Stamford, Conn., can verify that building a topnotch communications program pays big dividends. In 1956, after seven years of better communicating, it reported: Productivity up over 40 per cent; profits before taxes nearly tripled; dividends more than doubled; average annual income of all employees up from $3691 to $5752.

Wages and job status are, of course, of primary interest to the worker. But don't overlook your chance to inform him about other matters. Employees, in one survey of five companies, were asked to list nine subjects in the order of their interest. The composite: 1. New inventions and improved methods the company is using. 2. The company's business prospects. 3. How pay is determined. 4. How foremen are selected. 5. How income is divided (what share goes to the employee, to management, to the stockholders). 6. Competition and how it affects the company. 7. The men who run the company (who they are and what they do). 8. How a foreman's pay is determined. 9. The story of the company's development.

• The "how" of communicating is less important than management's philosophy and support of an active, full time effort to pass the word along.

The variety of means available for getting information across to employees makes it possible for any firm to find its own best way to exchange ideas and facts. Whether it's done through an employee magazine or a letter to the employee's home, every technique has its advantages and drawbacks (see exhibit). The one vital ingredient for any effective job is exchange; or, as Donald B. Greenwood of U. S. Steel Corp. puts it: "Communication has not taken place unless the message has been received and decoded. The sender and receiver must be

tuned in on the same frequency, and must be using mutually understood media."

• But, while the communications effort starts at the top, it must be operated clear down the management chain.

Authorities on employee relations tell STEEL that the oral, face to face leadership shown employees by their immediate supervisors is the determining factor in workers' attitudes toward the company. That means that foremen and other line management bear the greatest responsibility for keeping employees informed. Upper management must supply information to supervisors.

Prof. John W. Riegel, director of the University of Michigan's Bureau of Industrial Relations, says: "By far, the most effective (factor in employee relations) is the method of supervision, the leadership shown by supervisors and foremen. This is more important than all other methods put together. Publications have minor importance. They can be used to make announcements but this is secondary to the conduct of your boss, how he treats you, and the information and consideration provided employees in their daily working relations."

Recently, at the U. S. Naval Ordnance Test Station, China Lake, Calif., a research project was set up to assess the effectiveness of the various media used to communicate with the station's more than 4000 employees. A cross section of personnel were asked through which channel of communication they would most likely get the first word on an important change affecting their work. The response: Grapevine, 38 per cent of personnel; supervisor, 27 per cent; official memo, 17 per cent; station newspaper, 7 per cent; directive system, 4 per cent; bulletin boards, 4 per cent; other channels, 3 per cent.

Obviously, informal, oral communication stands out as the speediest form. However, other questions brought out that the employees place little reliance on the grapevine and prefer to get the official word from supervisors or in printed form. In planning a medium of employee communication, therefore, this survey would suggest that if speed is a prime factor, the channel used should not be weighed down with a lot of organizational red tape; physical distribution must be perfected so that all the employees are reached; workers' reliance on official sources means that communications should originate at the top.

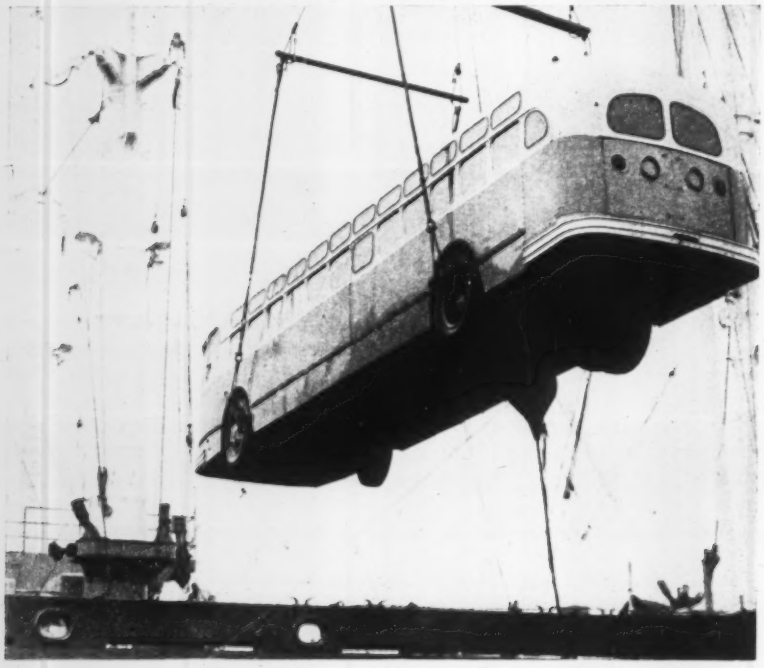
• One good way to open communication channels: Start out backward.

You can open sluggish channels by reviewing your current suggestion system or setting up a new one. Make the rewards as sizable as possible and see to it that helpful workers are given real recognition. This backward approach, getting employees to talk to management, can also be used to step up the effectiveness of a plant newspaper. Inaugurate a "questions" or "gripes" column in which employees are assured their questions will be answered by top management. The questions may range from "Why no extra soap in the washrooms?" to "What about this rumor that the company is going to close the plant?" But you can be sure that your viewpoint will draw more attention if the worker's viewpoint is taken seriously.

• Be careful not to ruin a good program with gimmicks and garbage.

Lawrence Stessin, writing in *Management Review*, cautions that too many executives are stressing "communications" at the expense of communicating. He points out that some basically sound ideas have been overdone or so ineptly handled that they backfired. (As with the boss's "open door" through which a worker never passes; or the monthly letter to employees' homes which used to open with "Dear Fellow Employee" until one worker wrote back to the president with the same friendly greeting.)

But, Mr. Stessin adds, when properly employed to help management perform what is, after all, its chief function — getting things done through others—then communications media can be valuable means of providing a basis for understanding, co-operation, and action.



THIS TROLLEY COACH and 114 more like it are being shipped to Brazilian cities by Marmon-Herrington Co. Inc., Indianapolis, builder of specialized commercial and military vehicles. They're said to be the first buses of this type to be produced in the U. S. since 1955—demand is down in this country because of changes in surface transportation in cities. Aluminum, supplied by the Metals Div. of Olin Mathieson Chemical Corp., was used in the bodies of the vehicles

• This is the second of a three-part series on how to deal with employees. How to keep supervisors happy was explained in the Aug. 31 issue. On Sept. 14 communication problems in conferences will be covered. An extra copy of any of these articles is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Foreign Investments Rise

U. S. investors now have $40.8 billion in holdings abroad, following the world-wide business recession. Earnings fell 9 per cent off the 1957 pace

U. S. INVESTORS added another $4 billion to holdings abroad in 1958, raising the total value to $40.8 billion, says the Office of Business Economics, U. S. Department of Commerce.

Direct investments by U. S. companies in foreign subsidiaries and branches advanced by $1.8 billion, considerably less than the high rates of 1956 and 1957. Most of the drop in growth of the 1958 direct investments reflected a sharp reduction in new petroleum investments which tumbled from $1.7 billion in 1957 to $700 million last year.

New investments abroad in manufacturing industries also slumped last year in line with the general business recession. A substantial upturn in manufacturing investments is expected this year, says Commerce. The biggest drops in new investment last year were in South America, Canada, and the United Kingdom; sizable gains were registered in the Common Market countries of France, Germany, and Italy.

• **Earnings Fall to $3.4 Billion**—U. S. foreign investments earned $3.4 billion in 1958, a decline of 9 per cent from the 1957 level. Earnings dropped by $375 million; heaviest losses were in Latin American petroleum earnings.

Dividend payments from direct investments abroad increased slightly in 1958, despite lower earnings, with undistributed profits of foreign subsidiaries dropping by 25 per cent to $750 million.

Foreign subsidiaries of manufacturing companies retained about half of their earnings in both 1957 and 1958. Last year, earnings and reinvestments were up substantially in Europe but lower in Canada and Latin America.

Total private investment abroad, $40.8 billion, is divided into the following areas: Canada, $14.2 billion; Latin America, $11.1 billion; Western Europe, $7.8 billion, and all other countries, $7.7 billion.

Kaiser Plans Indian Plant

Plans for establishing an integrated aluminum producing facility at Rihand in central India have been completed by Kaiser Aluminum & Chemical Corp., Oakland, Calif., and the Birla interests of C. D. Birla, Indian industrialist.

Kaiser and Birla have organized Hindustan Aluminum Corp. Ltd. to build and operate a 22,000 ton aluminum production plant with related bauxite and alumina facilities. Cost: $30 million. Completion date: 1962.

ECSC Speeds Tariff

The European Coal & Steel Community is hurrying preparations for a lower common external tariff. The move resulted from a vote by the Council of Ministers to support the American made "Dillon proposals." They call for a new round of multilateral negotiations in GATT (the 37 nation General Agreement on Tariffs & Trade). Aims: further tariff cuts and consequent expansion of world trade.

The acceleration of plans is to coincide with action taken by the 85th Congress to reduce U. S. tariffs as much as 20 per cent over a four year period (ending July, 1962). Before that date, the Community must complete its negotiations on "list G" items (those for which a common tariff is being negotiated among the six member nations), renegotiate with other GATT members the consolidated duties affected by the common tariff, and develop a new round of tariff cuts on the basis of the common tariff.

No Comment

Rep. Richard M. Simpson (R., Pa.) could barely contain himself last week as he reported to the House: *The Congressional Record* is stitched with British wire. He noted that in the first six months of 1959, all seven awards for stitching wire went to Holdwire Ltd., London. Representative Simpson has inquired into the origin of the wire used to stitch the official proceedings of the English Parliament.

ECSC Snubs Coal Aid

The Council of Ministers of the European Coal & Steel Community has rejected a four point proposal by the High Authority to ease the community's coal crisis. It was the first time in the seven year history of the ECSC that the Council openly opposed the High Authority.

The plan would have reduced imports, regulated production, frozen pithead stocks, and maintained miners' incomes. It failed to gain the necessary two-thirds majority because France, Germany, and Italy voted against the measure. Only Benelux nations favored it.

The High Authority has submitted to the council an outline of proposals for emergency action in the Belgian coal industry, hardest hit by the crisis. They range from stopgap measures to long term plans for streamlining the industry and improving its efficiency.

Japanese Economy Revives

The Japanese economy has pulled out of its 1957-58 recession in an unexpectedly swift rise, reports the Economic Planning Board. Reasons: 1. A sharp increase in inventory investments. 2. Industrial structure reform. 3. Favorable psychological effects created in economic circles by the quick business recovery in the U. S. 4. Positive economic policies by the government in the budget for the fiscal year started last April.

Henry Kearns makes some suggestions as . . .

Commerce Offers Export Aid

HENRY KEARNS, assistant commerce secretary for international affairs, is an old hand at selling. He is "well aware," he says, of the change in the pattern of world trade, and he believes the U. S. can take effective steps to keep the situation "in bounds." But he abhors the idea of cutting imports to maintain the U. S. balance of trade. Like a true salesman, he believes the answer to our problems is increased sales (in this case, exports). He encouragingly reports that a "quite substantial" increase in exports is ahead of us for the next 12 months, but he wants U. S. manufacturers to help the trend by co-operating with the Commerce Department on a new program for funneling product information overseas.

New Trade Promotion Service

The department's Bureau of Foreign Commerce wants U. S. firms and exporters to supply the information. BFC will pass the word along to our embassies and consulates abroad to aid commercial attaches when they are asked by a foreign buyer: Where can I buy American made widgits?

The form (FC-30) may be obtained from any of the department's 33 field offices, or from the Commercial Intelligence Division, BFC, Commerce Department, Washington 25, D. C. Information furnished to BFC will not be made public. The 3 by 5 in. cards will carry this information:

- Name and address of U. S. manufacturer and its export representative, if any, or the name and address of the U. S. export firm and the manufacturer represented. The cards will be indexed under the first name given. More than one card may be submitted in case the U. S. firm wishes to be indexed under a tradename, a name of a subsidiary, or by some other designation, in addition to its own name.
- Products exported, including trademarks. Detailed comments about products may be placed on the reverse side of the card.
- Name and address of representative or licensee.
- Type of representation (such as exclusive or non-exclusive agent, distributor, or licensee.)
- Territory covered.

Mr. Kearns suggests: "Participation by business in this service will determine its effectiveness." He believes the program is particularly applicable for small firms that haven't got a way of taking their story overseas.

Shock of a Buyer's Market

He thinks it is time for "the business community to shake itself out of the shock" of discovering the switch from a seller's to a buyer's market in exporting. He thinks exports may run $15 billion in 1959 compared with $16.2 billion in 1958 and $19.5 billion in 1957. In his opinion, those figures represent the height of the seller's market and the depth of the buyer's market. Now the trend is reversing.

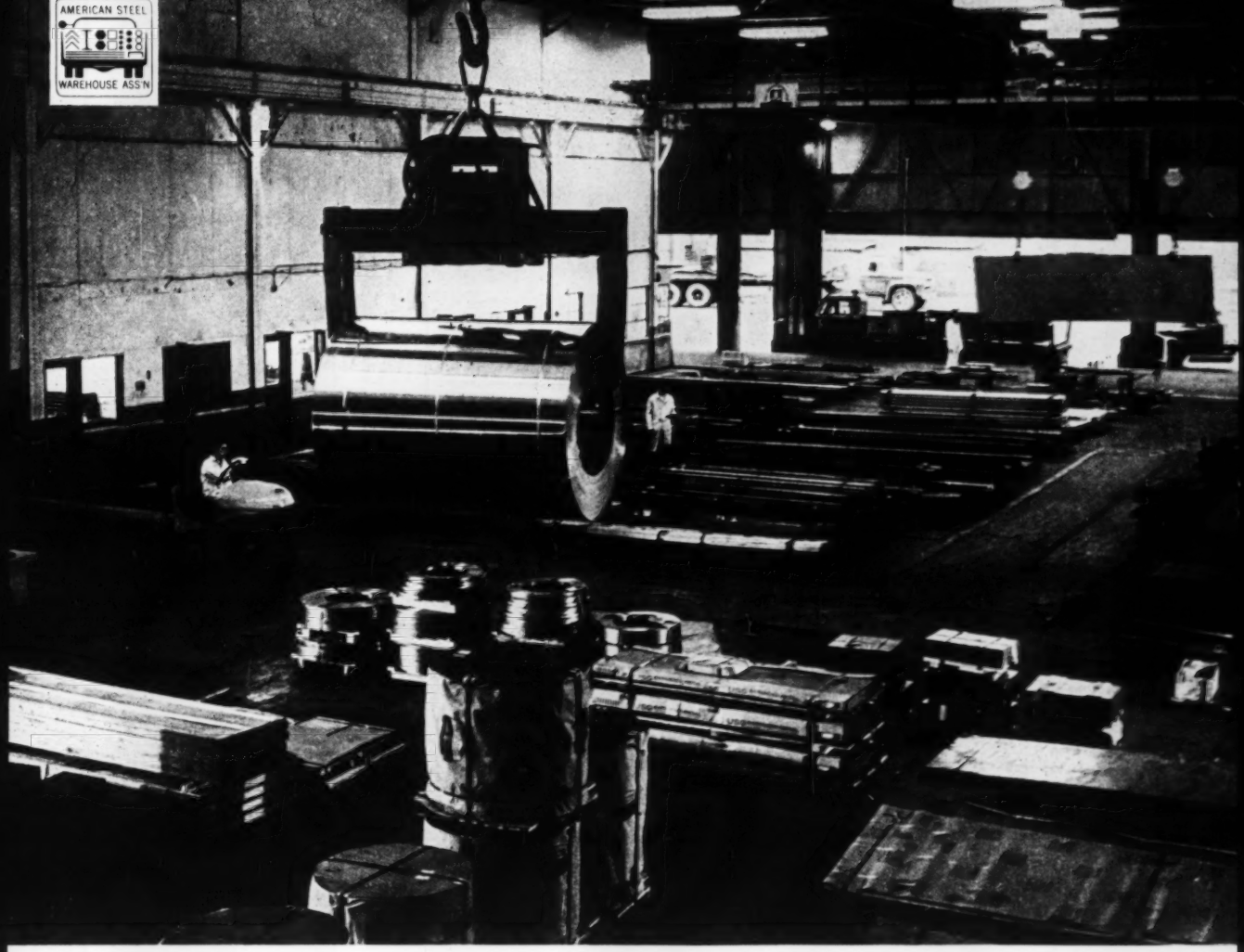
Mr. Kearns is adamant on one thing: "We are not pricing ourselves out of world markets." Price, he says as an experienced salesman, is only one aspect of the situation where we are losing sales overseas. He cites examples of U. S. firms losing overseas contracts because they fail to offer the service or guarantee made by foreign competitors.

Defense Plant Security Program Waits

Sen. John M. Butler's (R., Md.) defense plant security program is in danger of running into Congressional adjournment troubles. The bill is in the hands of the Internal Security Subcommittee of the Senate Judiciary Committee, and no action is scheduled yet. Talk of adjournment between Sept. 15 and Oct. 1 is strong on Capitol Hill. Senator Butler contends action must be taken because: Since the Supreme Court ruling of June 20, "there has been no industrial security program." (The Supreme Court ruled an act of Congress was needed to implement the security program which had been administered by the Defense Department.)

New Navy Bureau Established

To replace the Bureau of Ordnance and the Bureau of Aeronautics, the Navy has set up a Bureau of Naval Weapons. Operations are scheduled for Jan. 1, 1960. The four operating areas: Research, development, testing, and evaluation; procurement and production; fleet readiness; field support. Technical advances in missiles and electronics were primarily responsible for the need to integrate the two old bureaus.



A typical view of a J & L shipping floor. Neatness is the keynote to well organized efficiency in shipping all orders.

Extra Care at "The Department Store of Steel" means your order's right—and right on time

● Anywhere you look, in any operation, you'll find *extra care* on the job at The Department Store of Steel. Take the neat, efficiently organized shipping dock as an example. Coils are moved with coil grabs, cold finished bars are handled with rope instead of chain, long structurals and heavy plate are raised with double hoists instead of single. All orders are carefully loaded onto modern steel carriers and skillful drivers deliver these orders right to your dock.

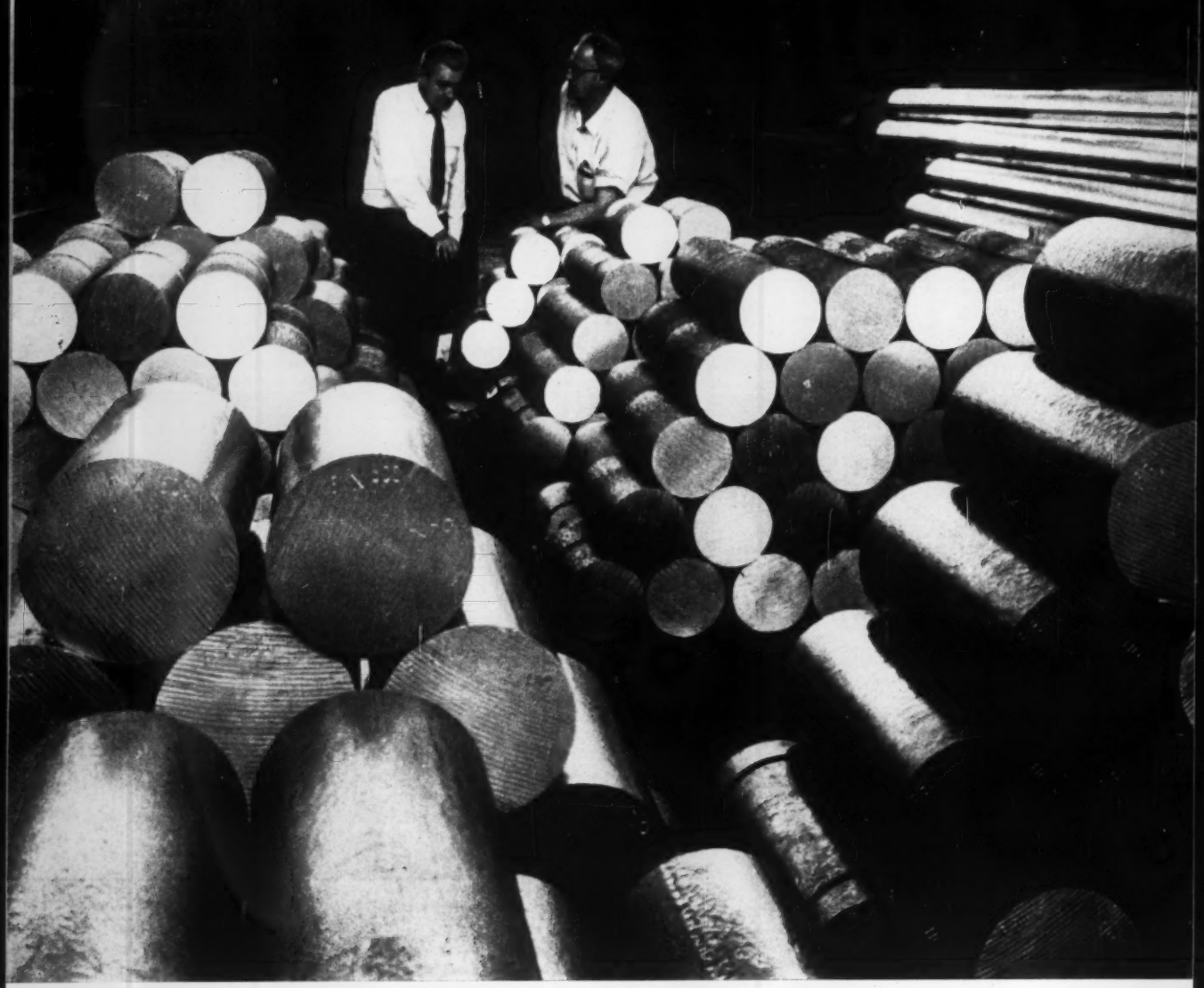
Call your J & L Steel Service Center for your next steel, stainless or aluminum requirement. Take advantage of the *extra care* practiced in every operation at The Department Store of Steel. See for yourself how *extra care* means your order's right—and right on time.

J & L Steel Warehouse Division

DIVISION OFFICES · INDIANAPOLIS, INDIANA

CHICAGO · CINCINNATI · CLEVELAND · DETROIT
HAMMOND · INDIANAPOLIS · LANCASTER · LOUISVILLE · MEMPHIS
NASHVILLE · NEW ORLEANS · NEW YORK · PITTSBURGH

J&L
The Department Store of Steel



ALCAN extrusion ingot gives you these 4 dollar-saving advantages!

1. Better finish! 2. Greater extrudability! 3. Higher recovery! 4. Longer die-life! . . . four important reasons why ALCAN extrusion ingot may be far more economical than the billet you're now using!

How much will this better quality billet save? For an exact answer test-run ALCAN billet on your own equipment. Carefully measure its performance and true cost. See how much easier and faster it extrudes. How it reduces scrap and lengthens die-life. How it actually makes a difference in the quality of your finish.

From mining to casting—countless checks on quality make ALCAN the finest of all billet products. It is made entirely of clean, primary metal . . . unexcelled in internal structure and surface smoothness . . . and cast to the industry's closest tolerances.

Telephone our nearest office today about testing ALCAN billet on your own equipment! We welcome the opportunity to show you the difference it can make in your extruding costs and productivity.

Aluminium
Limited

Ingot Specialist...serving
American Aluminum Fabricators—

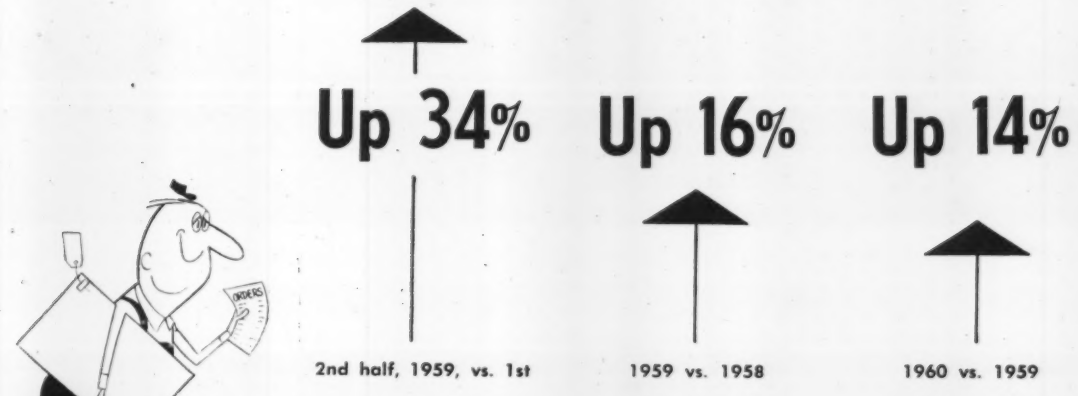
In the U.S.—Aluminium Limited Sales, Inc., 630 Fifth Avenue, N.Y. 20, N.Y.
CLEVELAND • CHICAGO • LOS ANGELES • DETROIT • ATLANTA • ST. LOUIS

Additional distribution (Alcan Foundry Alloys):
Apex Smelting Company, Chicago, Cleveland, Los Angeles
Charles Batchelder Co., Inc., Botsford, Conn.

THE CAPITAL SPENDING **BOOM** BEGINS

TESTING & INSPECTION EQUIPMENT:

How Orders Will Accelerate



"RIGHT NOW, we're getting more orders than we've had for at least five years." The speaker is a happy vice president of a big eastern producer of testing and inspection equipment. "We had an 18 month slump, but we've come out of it with a bang," he adds. He expects his firm's second half dollar volume of orders to be 30 per cent better than that of the first half.

• **He's Typical**—Every producer of testing and inspection equipment contacted by STEEL expects his second half volume to equal or exceed that of the first six months. Gains of 20 per cent are common.

STEEL's semiannual survey of equipment buyers (July 13, p. 56) points to a boom. By industries, here's how spending for testing and inspection equipment will advance in the second half vs. the first:

Foundry	Up 109%
Automotive	Up 84%
Aircraft	Up 56%
Electrical machinery & equipment	Up 34%
Steel	Up 12%
Metalworking machinery	Down 27%

These industries are also boosting their outlays: Electronics, nonferrous, farm equipment.

• **A Big '59**—It means that 1959 sales of testing and inspection equipment will be at least 20 per cent better than those of 1958.

• **A Bigger '60**—The average producer looks for his 1960 dollar volume of orders to be 14.5 per cent greater than those of 1959. Estimates range from "about the same" to "up 50 per cent."

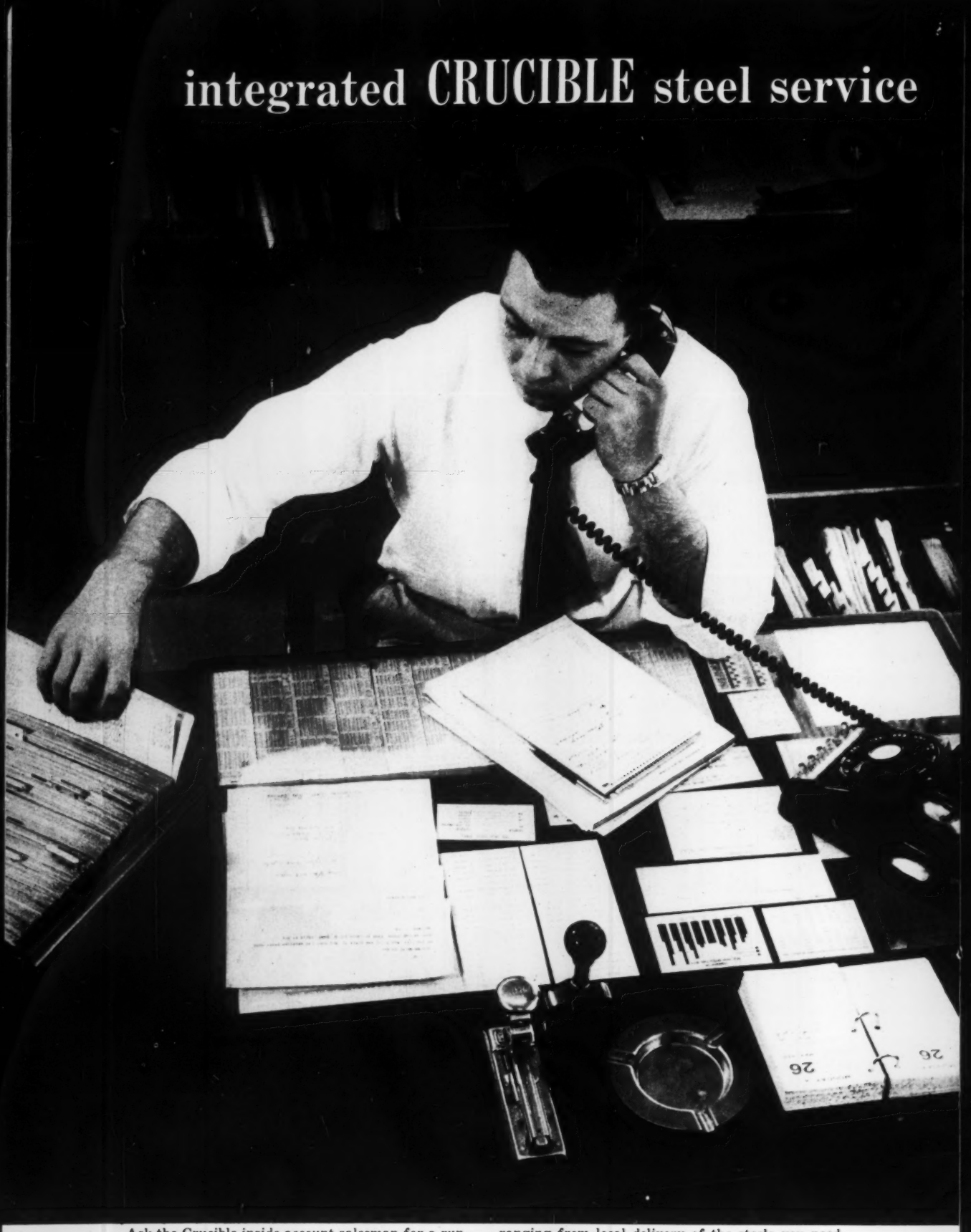
• **Price Outlook** — You'll have a tougher time buying testing and inspection equipment at cut rate prices than you will for most other types of capital equipment. Only about 1 in 15 producers classifies price competition as "critical." About 1 in 5 terms it "serious." Most producers say it's "mild" or "active." And few producers expect the situation to change in the coming six months. Only one producer expects the price competition to become more severe.

STEEL did uncover a few instances where prices were shaved to obtain contracts. One company made a 15 per cent cut to land a missile job. Another firm got a contract to supply a machinery maker by lowering charges 18 per cent. Producers report that another firm is regularly cutting prices to get its foot in a new market door.

• **Foreign Competition** — Foreign firms haven't made many inroads in domestic markets for testing and inspection equipment. They have succeeded in trimming U. S. producers' shares of the world market. One reason: They can undercut U. S. makers' prices by up to 50 per cent in Europe, but they haven't offered goods in the U. S. with sizable price differentials yet. A few American equipment makers expect European producers to attempt to expand into the U. S. in the next two to three years. They say they're feeling some foreign competition in optical equipment and nondestructive testing instruments. But most makers feel the U. S. industry holds a technological edge in this field.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service* STEEL, *Penton Bldg., Cleveland 13, Ohio.*

integrated CRUCIBLE steel service



Ask the Crucible inside account salesman for a run-down on all the services his warehouse offers. He's your contact with completely integrated services ranging from local delivery of the steels you need to metal research.

makes available a local

4-POINT SPECIALTY STEEL SERVICE

to both large and small users

All 32 warehouses offer
(1) simplified ordering
(2) in-stock deliveries
(3) metalworking assistance
(4) metal research

Each Crucible warehouse is a ***specialty steel service center*** – stocked, staffed and equipped to give you a wide range of services.

Here's what the warehouse near you can offer –

(1) *Simplified Ordering.* The inside account salesman assigned to you expedites all your orders, arranges for extra services and speeds up shipments when necessary. His personal responsibility means convenient ordering, no delays, no mistakes, nor misunderstandings.

(2) *In-stock delivery* of 16,000 specialty steel items, cut or processed to your specifications. Because warehouses maintain these stocks at high levels, you're sure of getting immediate delivery.

(3) *Metalworking assistance.* Experienced service engineers will work with your engineers to solve machining, heat treating or any other metalworking problem.

(4) *Metal research.* Crucible metallurgists visit local warehouses regularly. They'll bring the benefits of Crucible's experience and continuing research to your plant, too.

This service in depth is available because the Crucible operation is completely integrated from ore to steelmaking to warehouse delivery to you. But get full details. Ask the Crucible salesman to list all the services his warehouse offers. *Crucible Steel Company of America, Dept. r115, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

STOCK LIST

Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source For All These Steels

To speed up cutting on your orders, warehouses are now equipped with the latest hacksaws, and continuous-cutting and self-aligning bandsaws.

Average local warehouse continually replenishes stocks of 16,000 specialty steel items—gives you overnight delivery on almost all.

Sales-service engineers — who specialize in tool steels, stainless, alloys— will gladly help you with any type of metalworking problem.

TOOL STEELS–Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

HIGH SPEED STEELS–Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

STAINLESS STEELS – Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

FREE MACHINING STEELS – Crucible Max-el®

rounds, hexagons, plates and brake die steel

ALLOY STEELS – Bars, billets, strip and sheet

COLD ROLLED CARBON SPRING STEELS

DRILL STEELS – Hollow and solid drill steels

ALUMINUM EXTRUSION DIE STEELS

HOLLOW TOOL STEEL

WELDING AND HARD FACING ROD

PLASTIC MOLD STEELS

PERMANENT MAGNETS

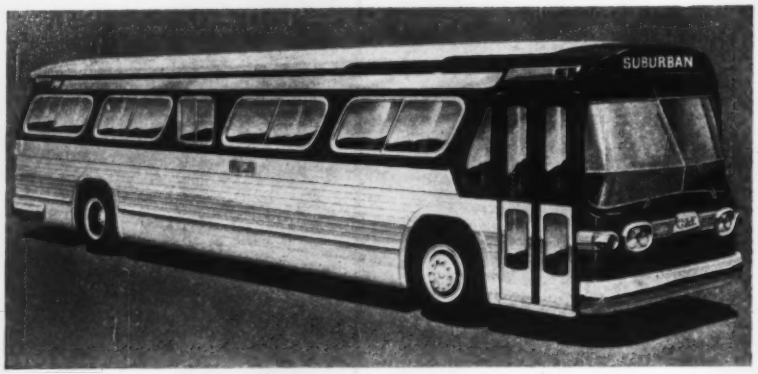
– and many others

CRUCIBLE STEEL COMPANY OF AMERICA

Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Columbus • Dallas • Dayton Denver • Detroit • Erie, Pa. • Grand Rapids • Harrison • Houston • Indianapolis • Kansas City • Los Angeles • Milwaukee • New Haven • New York Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • Salt Lake City • San Francisco • Seattle • Springfield, Mass. • St. Louis

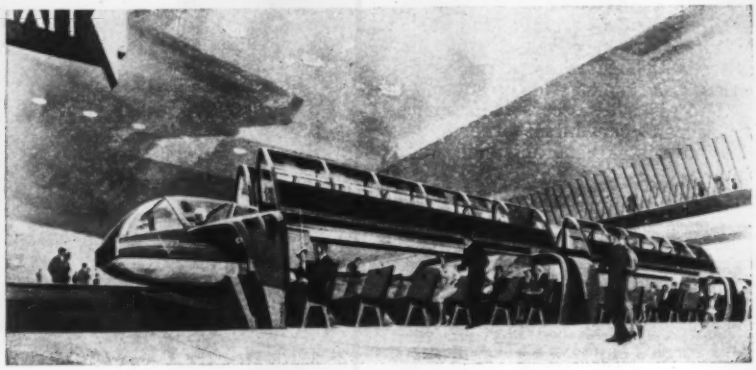
Turnaround for Urban Transit?

From This?



General Motors Corp.'s (Truck & Coach Div.) latest for suburban commuters

To This?



Proposed Century 21 Exposition monorail to be built by Lockheed Aircraft Corp. for the Seattle Transit System

CITY PLANNERS may revitalize the market for urban transit equipment and develop some astounding new markets for alert metalworking companies.

Hardly a major city in the U. S. is without a long range planning group of some sort: In almost every case, the use of transit equipment is an integral part of development planning. Notes Washington's "Mass Transportation Study" (transmitted to the President in July): "Transportation is one of the most important influences on the development of urban areas, and must be an integral part of the comprehensive plan for the future metropolitan region."

If Washington's plan is adopted by Congress, $458.5 million will be spent for rail facilities and $68 million for express buses. The National Capital Planning Commission and the National Capital Regional Planning Council, authors of the plan, think "a large part of these facilities should be built within the next ten years."

Richard Kraft, director for the planning council, points out that U. S. cities having more than 1 million population today total 13 and suggests there could be 25 within 10 to 15 years. Those are the cities which must have fast, efficient, and pleasant mass transit facilities if they are to grow without strangling themselves every morning in the rush hour.

• The greatest need for this sort of transportation, and hence metalworking's best markets, are in cities like Washington, where a high percentage of the population works downtown.

With U. S. population expanding and cities spreading out, can you imagine yourself in 1980 crawling to and from work on an 18 lane freeway? Highway engineers usually agree the maximum practical width for a freeway would provide eight lanes, yet Washington would need 18 to handle the traffic from Wheaton, Md., a fast growing suburb, by 1980—that is, if Washington's present mass transit facilities were all that were available then, and 152,000 automobiles had to move the rest of the city's workers to their jobs. Project that image to 25 other U. S. cities and you see why urban planners are about to give metalworking's transit equipment suppliers a new lease on life.

• The public will have to be convinced that mass transportation is the best way to travel, and it is going to have to be willing to pay for it, either directly, or through taxes.

These figures from the American

Transit Association show what happened to operating transit firms in 1958: At the end of the year, there were 1300 operating companies compared with 1324 at the end of 1957. Five electric railway companies went out of business, for example, as did five trolley bus firms.

Operating firms carried 9.7 billion passengers last year compared with 10.4 billion in 1957. While the urban population of the country has grown from 72 million in 1935 to 94 million in 1958, riders of urban transit systems have declined 20 per cent. Dip in new urban transit equipment delivered during the years (see table) is not surprising.

• Bus sales are showing signs of leading the trend to greater sales in all kinds of urban transit equipment.

General Motors Corp.'s Truck & Coach Div., Pontiac, Mich., reports glamourizing (as well as technological) changes in city bus designs. Philip J. Monaghan, division general manager and a GM vice president, says four new models to carry 45 to 53 passengers each "are the first completely new models for city use that we have had in 19 years."

The death of the street car is another factor in bus sales. For example, Washington's transit system, which had a modern fleet of 508 cars in 1956, now operates only 310, and will be an all bus operation by '63. You can get an idea of the market potential on a national basis by figuring Washington's needs as a base: The transit system estimates it must average 80 new buses a year for the next 14 years just to maintain present routes and passenger volume.

• Via the tremendous highway program, the bus is stepping into an area once thought reserved for railways: Fast service over a separate right of way.

Lanes are being reserved for buses on many freeways; stops are well spaced; park and ride plans are becoming common at freeway entrances.

There is no thought, though, that buses can take over all the functions of city rail travel. Washington needs, the planning commission reports, four rail lines, with a downtown area subway system.

Indeed, rail transit seems about to turn around too. New York will complete a $58 million project, adding 2½ miles to its subway system, by 1962. It plans to purchase 1410 cars as old cars are retired.

Boston is planning a $21 million, one mile subway link. Philadelphia is constructing three miles of track. San Francisco has not firmed its plans, but an interurban system is foreseen.

Other transit devices receiving more attention from city planners include monorail and conveyor belts.

• Monorail deserves special attention because several metalworking companies are in the field or in the process of seriously evaluating it.

If Congress appropriates money for the Seattle, Wash., Century 21 Exposition (scheduled to open in 1961), Lockheed Aircraft Corp., Burbank, Calif., will build a one mile monorail from downtown to the fair site. Three electrically propelled "air trains" plus supporting structures and terminals will cost $5 million. St. Louis Car Co., St. Louis, has offered D. C. Transit a car for a proposed 116 mile route. This proposal is not a part of the capital's official plans.

Washington's planners have been accused of being conservative for not choosing monorail. They favor the more advanced designs of two rail subway and elevated rapid transit cars now available from domestic manufacturers (like St. Louis Car, Pullman-Standard Div. of Pullman Inc., Budd Co., and American Car & Foundry Co.) and foreign firms.

• Business Needed — Perhaps the best answer to the controversy is by a St. Louis Car spokesman, who told STEEL: "We want to build cars. If D. C. Transit wants to build monorail, we'll do it, but we are not saying monorail is the answer."

Lockheed's answer is that "monorail can use streets, freeways, or existing rights of way without need for extensive land acquisition." For example, it recommends monorail for Los Angeles. It's reported that Lockheed and Norair, a division of Northrop Corp., Hawthorne, Calif., are both making monorail presentations to the city. About six U. S. cities may be seriously considering monorail. One firm estimates 300 cities in the world should have monorail or a comparable system. But the experts have reservations: "It is not yet a working tool; no one has experienced all the problems of monorail," says W. S. Rainville Jr., research director, ATA.

Trends in Urban Transport of Passengers

(New equipment delivered to U. S. transit companies)

	Surface Railway Cars	Subway & Elevated Railway Cars	Trolley Buses	Motor Buses
1958	0	428	0	1698
1957	0	469	0	1946
1956	0	376	0	2759
1954	0	260	0	2225
1952	19	0	224	1749
1950	4	199	179	2668
1948	478	248	1430	7009

Source: American Transit Association.

US RUBBER **PowerGrip** "TIMING" BELTS

Why are today's outboards streamlined, faster, dependable?

A good deal of the reason is U. S. PowerGrip "Timing"® Belts, invented and perfected by "U. S." Engineers, now in use on the majority of the new outboard motors. PowerGrip gives a positive, non-slip drive. It assures constant electrical output without chance of slip-up—generator performs perfectly always.

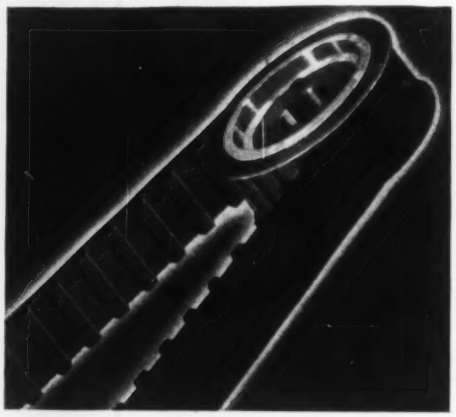
Other advantages that make PowerGrip indispensable:

- Trouble-free — no lubrication, noiseless, corrosion-resistant.
- Compact—short center-to-center distance, light weight.
- Safer—no slip to wear out belt, or cause breakdowns.

The U. S. PowerGrip "Timing" Belt drive may well improve your product, just as it has improved outboard motors. These drives are available in stock for every industry from U. S. PowerGrip "Timing" Belt Distributors, from fractional to 1000 hp.

• • •

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.



US RUBBER

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

AMC's Romney: Prophet with Honor

He says the compact car boom has arrived

JUST THREE YEARS AGO, George Romney, American Motors Corp.'s president, had tears in his eyes as he pleaded with newsmen not to "write his company off." He was convinced that the public would have to adopt the compact car philosophy he had been preaching for years.

Few believed he could pull it off. AMC had some $40 million in short term debts. Its sales were accounting for less than 2 per cent of the market. Most of its 1900 dealers were wondering when was the most appropriate moment to jump ship. Their combined net worth was only $50 million. Ramblers didn't seem to be in the running with the sleek, flashy cars being introduced by the Big Three.

While Mr. Romney talked economy, Detroit revved up for another sprint up the horsepower track.

• **AMC's New Look** — The tables have turned. Ramblers are taking 6.5 per cent of the industry's sales. The company's short term loans are paid off, and its long term debts ($10 million) in relationship to total capital are smaller than those of any other automaker. Instead of the $19.7 million loss it recorded in its fiscal 1956 year, AMC should show close to $70 million in net earnings for fiscal 1958-59. Employment is up from 9000 to 21,700. The company has 3000 enthusiastic and well placed dealers whose net worth totals $169 million.

Most important, the compact car message has been sold. Mr. Romney's crystal ball was right, and as he puts it today: "We've see a complete reversal on the part of our competitors. In the fall of 1954 they sympathetically ignored us. Two years ago, they started explaining us. Then they got mad at us, and now they're imitating us."

Whether you personally like Ramblers or other compact cars, you'll have to admit Mr. Romney has made his pitch pay off. Admittedly, he had little choice. It was either follow the compact car approach or get out of business. And last year's recession certainly helped solidify the public's demand for economical transportation. But give him credit for having the guts to stick with what looked like an impossible deal.

Rambler's Calendar Year Sales

	(In thousands)	(% of Industry)
1960*	512.0	8.0
1959‡	364.5	6.4
1958	186.2	4.0
1957	91.4	1.5
1956†	115.1	1.9

*AMC's estimate. ‡Anticipated. †Includes Nash and Hudson before merger. Source: R. L. Polk Co. and AMC reports.

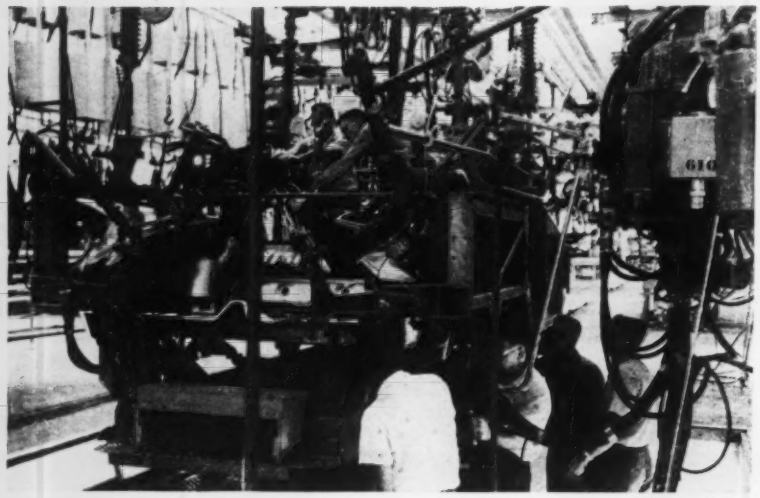
• **Makes Detroit Listen**—When Mr. Romney talks about the compact car market today, it's a good idea to listen. Here's the latest: He thinks that by 1965 smaller cars will be accounting for 60 per cent of new car sales. Even next year they'll be knocking off 2.25 million sales or 30 per cent of the market. He figures 1.75 million of them will be compact automobiles (STEEL, Aug. 31, p. 45).

Where will the sales come from? S. E. Knudsen, Pontiac's general manager, says: "I don't think the compact cars will have any effect on the medium price field." Mr. Romney disagrees: "If anybody is going to get seriously hurt, it will be the present medium price cars or other big car lines." To prove it, he points out that so far this year, 79.5 per cent of all Rambler buyers have traded in used cars. Some 41.1 per cent traded in Fords, Chevrolets, or Plymouths. Another 27.7 per cent traded medium or high price cars; 3.7 per cent traded imports, and 24.8 per cent swapped their old Ramblers.

At the same time, the medium price market slipped 8 per cent below its 1957 sales penetration, while small and compact cars increased their share of the market 12 per cent. Other cars, mostly Ford, Chevy, Plymouth, dropped only 4 per cent of their market penetration.

• **And Wonder**—Mr. Romney says the situation reveals three significant facts: 1. Total big car market penetration has declined. 2. The increase in small and compact car sales has been largely at the expense of me-

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)



THIS 1960 CAR may be the Dodge Dart. It's being assembled in Chrysler's new preproduction line at the Clairpointe (Detroit) plant. The pint size assembly line turns out one car per hour using regular production parts. Objectives: 1. To check each vehicle and part for quality and fit. 2. To train assembly line supervisors so they can return to their own plants ready to instruct their own men

dium price lines. 3. Chevrolet, Ford, and Plymouth's percentage of industry sales has been maintained largely at the expense of medium price lines.

The trends will continue, declares Mr. Romney. He doesn't believe the introduction of Corvair, Valiant, and Falcon will bite deeply into Rambler or import sales. Mr. Romney says: "With compact cars in Chevrolet, Ford, and Plymouth salesrooms, a lot of people who walk in to buy Chevrolets, Fords, and Plymouths are going to buy compact cars. Either these dealers are going to sell fewer Chevrolets, Fords, and Plymouths or they are going to sell more of them to people who previously have been buying medium price lines!"

• **If Romney's Right** — How will AMC make out in this compact car surge? Mr. Romney indicates import sales have reached their peak, but he predicts Ramblers will be taking 25 per cent of 1965's compact car sales. He's after 8 per cent of the market next year and is in an excellent spot to get it.

AMC is in the enviable position of finding the shoe on the other foot. Now it's the company with a full line of compact cars, while Ford, GM, and Chrysler have only a limited selection in their showrooms. Not only that, but Rambler's 20 years of unit body building will insure quality. Big Three unitized cars may have some problems.

Stylewise, Rambler has made worthwhile improvements in sheet metal without sacrificing headroom, legroom, or seating comfort. As indicated in STEEL (Mar. 2, p. 87), the 1960 models are lower. Fins no longer are tacked on but blend neatly into the rear quarters. The American, which is accounting for 24 per cent of Rambler sales, is unchanged in styling, but an additional series will be offered.

With its centralized manufacturing operations in Wisconsin, AMC finds the costs of transporting parts and material handling are significantly lower than they were. Those factors and stable car designs make the company's overhead costs among the lowest in the industry. It started 1959 with a capacity to build 330,000 cars. It now has enough capacity to build over 500,000. Mr. Romney's crystal ball says he can do exactly that next year.

Britain Builds an Odd One

A small car that has the engine and transmission mounted parallel to the front axle has been announced by British Motors Corp. It will be called the Morris Miniminor and Austin Seven and will be sold by BMC's Morris and Austin divisions. Price is $980 in England.

By mounting the engine sideways, BMC gets a unique front wheel drive and eliminates the transmission hump in the passenger compartment. The four cylinder engine develops 36 hp and has a top speed of 70 mph. Gas consumption averages 46 mpg, says BMC.

Ford Plans to Finance

Ford Motor Credit Co. is the name of the wholly owned subsidiary the Dearborn, Mich., automaker has established so it can enter the auto financing business. Robert S. Olson, former director of Ford Motor Co.'s dealer financing office, is president of the subsidiary.

Earlier announcements that Ford would enter the financing field resulted in antitrust hearings in Washington. Senators feared the auto companies would monopolize automobile credit. GM has had its own financing subsidiary, GMAC, for many years. Talk had it that Chrysler was considering a similar setup although it seemed unlikely. Independent credit firms have vigorously opposed the Ford move. Result: Two bills have been introduced to prevent automakers from financing their own products. Both are pigeonholed, pending hearings that aren't likely to develop.

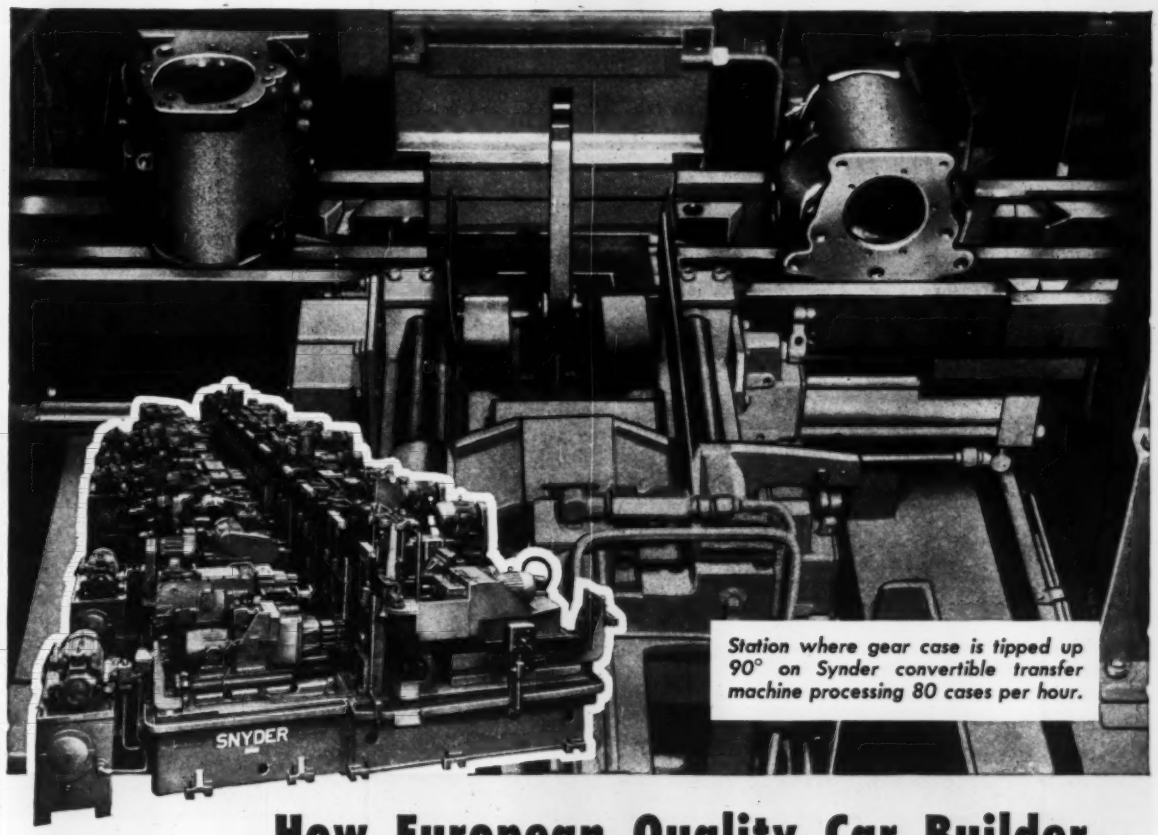
U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
May	546,817	349,613
June	557,994	337,446
July	555,418	321,017
August	238,620†	180,447
8 Mo. Totals	4,078,000†	2,743,812
September		130,460
October		261,701
November		514,152
December		593,920
Total		4,244,045

Week Ended	1959	1958
Aug. 1	122,518	62,846
Aug. 8	108,240	65,614
Aug. 15	72,603	59,677
Aug. 22	31,848	25,918
Aug. 29	18,396†	16,771
Sept. 5	15,000*	12,016

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.



Station where gear case is tipped up 90° on Synder convertible transfer machine processing 80 cases per hour.

How European Quality Car Builder Snyderizes for the Soaring Sixties

This new 53-station transfer machine combines special purpose efficiency with high convertibility for later changes. Part orienting devices enable Snyder to utilize standard horizontal way-type units to drill, spotface, chamfer, ream, line-ream, mill and bore this cast iron standard gear transmission case on all faces. The cases are turned 90° at the thirteenth station and tipped up 90° at the thirty-eighth station, which eliminates vertical machining units. The part is specifically located on faces not subject to future design changes, thus reducing future capital expenditure.

★ ★ ★

Let us show *you* how to SNYDERIZE FOR THE SOARING SIXTIES for more efficient parts handling, gaging, assembly and machining. Send or phone for new brochure with resume of Snyder machines engineered for profit improvement.

Standard Features of Snyder Machines

1. SNYDER SELF-CONTAINED UNITS and other units equipped with hardened and ground steel ways.
2. Threading and tap heads equipped with individual lead-screw spindles.
3. Minimum downtime for tool changes because spindles are arranged for pre-set cutting tools.
4. Automatic lubrication.
5. J.I.C. Standards throughout.
6. Electrical interlocks and full depth circuit throughout.
7. Panels equipped with SNYDER CIRCUIT SLEUTH.

SNYDER
CORPORATION
(Formerly Snyder Tool & Engineering Company)
3400 E. LAFAYETTE—DETROIT 7, MICHIGAN
Phone: LO 7-0123

Now the nation's third largest steel plate producer

Left to right: George Copeland, Manager of Lukens' newly consolidated Sales Service Division, with department heads Arthur Powers of Customer Service, and Richard Slider of Order Processing.

LUKENS STREAMLINES ITS CUSTOMER SERVICES

The demanding process of making quality steel plate can't be rushed. But Lukens *has* cut the time it takes to process your orders and answer service inquiries.

In our *Customer Service Dept.*, for example, quotations, order status information, and similar requests are now handled by five area supervisors, each with a specific geographic territory to serve. All five are located in Coatesville. They and their staff members are ready to supply detailed information on any and all Lukens products—direct or through our sales offices.

Result: shortened lines of communication . . . faster action . . . greater customer satisfaction.

Equally important, our *Order Processing Dept.* has also been re-shaped. This one department now handles all orders for Lukens as well as for its Fabricating Division.

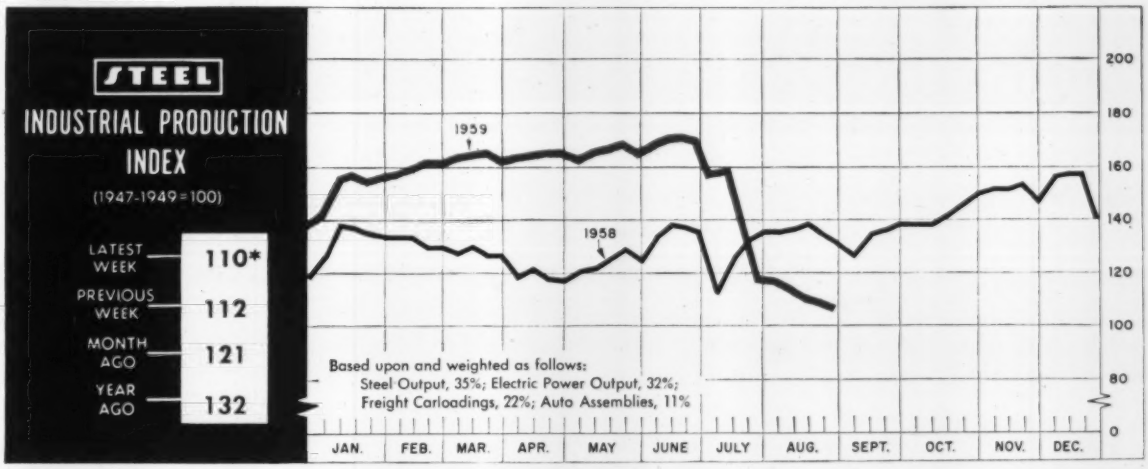
Streamlining our entire service organization was a logical complement to Lukens' "Phase A" expansion objectives: *new capacity and quality levels to meet the growing needs of our plate fabricating customers.*

Lukens Steel Company, Coatesville, Pa.

NEW CAPACITY ~ NEW QUALITY

LUKENS

SERVING INDUSTRY WITH A WIDE RANGE OF SPECIALTY CARBON, ALLOY, ARMOR AND CLAD STEEL PLATE • HEADS • PLATE SHAPES • PLATE-MATE WELDING ELECTRODES AND WIRE



*Week ended Aug. 29.

Fall Upturn Around the Corner

LABOR DAY traditionally marks the turn from the summer doldrums into the fall upswing in industrial activity. While the pattern will be followed this year, don't expect any dramatic upheaval until the steel strike is settled.

STEEL's index above has virtually reached the end of its descent (except for the holiday week). During the week ended Aug. 29, it slipped another 2 points to a preliminary 110 (1947-49 = 100), bringing the total loss since the high mark in mid-June to 64 points. Only record use of electric power has kept it from going lower.

• **Trend to Start Up**—It will be two—maybe three—weeks before you will see a small upturn in the index. Auto producers are beginning to turn out 1960 models, but full production won't come until October. Week-to-week gains in motordom will be partially offset by a seasonal decline in power output. In addition, if the steel strike continues, there undoubtedly will be a slowdown in metal fabricating toward the end of the month, which will further depress carloadings and industrial use of electricity.

Manufacturers are still long on steel supplies, but in another two or three weeks, they will start to feel imbalances in their own and suppliers' stocks. (To date, shutdowns have been the exception to the rule.) It's also likely that slowdowns will come as users try to conserve what supplies they have. They know it will be weeks before normal supply channels are filled.

• **Depends on Autos**—The word from the auto capital is one of encouragement. Producers are selling and planning as if they had never heard of the steel strike. Originally, they figured they might lose between 100,000 and 150,000 new car sales, but so far there is no indication of any loss. During the first 20 days of August, dealers retailed cars at a monthly rate of 470,000

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	340[1]	332	1,666
Electric Power Distributed (million kw-hr)	14,000[1]	14,003	12,272
Bituminous Coal Output (1,000 tons)	7,105[1]	7,145	8,223
Crude Oil Production (daily avg—1,000 bbl)	6,800[1]	6,817	6,863
Construction Volume (*ENR*—millions)	$293.0	$377.9	$397.8
Auto, Truck Output, U. S., Canada (*Ward's*)	34,472[1]	49,546	28,406
TRADE			
Freight Carloadings (1,000 Cars)	540[1]	543	645
Business Failures (Dun & Bradstreet)	263	269	272
Currency in Circulation (millions)[3]	$31,951	$32,051	$31,249
Dept. Store Sales (changes from year ago)[3]	−1%	+6%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,744	$24,938	$19,905
Federal Gross Debt (billions)	$289.5	$288.3	$278.1
Bond Volume, NYSE (millions)	$22.5	$24.8	$23.3
Stocks Sales, NYSE (thousands of shares)	10,505	11,762	13,578
Loans and Investments (billions)[4]	$105.2	$104.9	$94.8
U. S. Govt. Obligations Held (billions)[4]	$29.4	$29.2	$33.3
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	246.65
STEEL's Nonferrous Metal Price Index[6]	220.9	220.8	198.8
All Commodities[7]	119.2	119.3	118.7
Commodities Other than Farm & Foods[7]	128.3	128.3	125.9

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

Cleaning Problem?

SONOCEN®

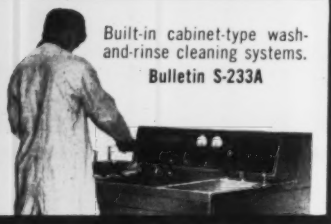
Ultrasonic Cleaners by

BRANSON

may be your answer!

½-gallon and larger benchtop models, and (illustrated) 5- and 12-gallon self-contained rollaround units.

Bulletin S-509, S-217B

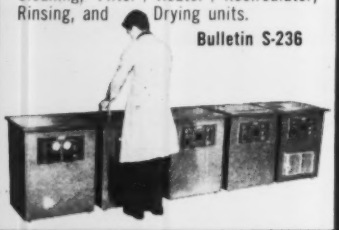


Built-in cabinet-type wash-and-rinse cleaning systems.

Bulletin S-233A

Modular cabinet-type systems with Cleaning, Filter / Heater / Recirculator, Rinsing, and Drying units.

Bulletin S-236



Custom-engineered cleaning installations: for batch and conveyorized cleaning, and for continuous-flow cleaning in strip and wire mills.

Bulletin S-235

Branson offers experienced counsel in adapting the flexibility of SONOGEN® Ultrasonic Cleaning Equipment to **your** needs. Tell us the problem, and we'll follow through from planning and installation to maintenance, with factory-trained specialists available nationwide.

Send Coupon to **BRANSON ULTRASONIC CORPORATION**
36 Brown House Road, Stamford, Connecticut

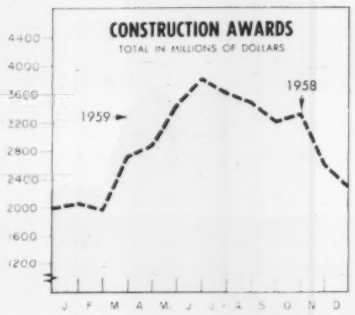
BRANSON: Send SONOGEN® Bulletin

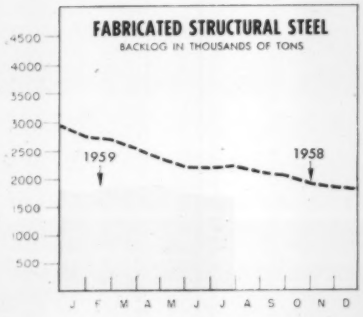
NAME

FIRM DEPT.

ADDRESS

THE BUSINESS TREND





	Total		Building	
	1959	1958	1959	1958
Jan.	2,319.2	2,060.0	1,839.7	1,530.2
Feb.	2,307.0	1,953.4	1,777.4	1,478.1
Mar.	3,339.9	2,721.2	2,453.9	2,037.7
Apr.	3,778.4	2,881.0	3,018.0	2,198.0
May	3,541.9	3,402.6	2,748.8	2,470.3
June	3,659.0	3,819.6	2,816.9	2,340.3
July	3,656.5	3,607.1	2,880.8	2,633.5
Aug.	.....	3,466.6	.....	2,529.5
Sept.	.....	3,215.9	.....	2,352.5
Oct.	.....	3,309.0	.....	2,549.8
Nov.	.....	2,593.9	.....	1,980.8
Dec.	.....	2,281.9	.....	1,728.6
Totals	.....	35,312.2	.....	25,829.3

F. W. Dodge Corp.

Charts copyright, 1959, STEEL.

	Shipments		Backlogs	
	1959	1958	1959	1958
Jan.	224.3	316.7	1,794	2,778
Feb.	216.1	282.6	1,864	2,727
Mar.	260.5	336.6	1,873	2,542
Apr.	290.6	323.6	1,922	2,387
May	294.1	328.2	1,768	2,211
June	365.4	329.2	1,717	2,191
July	238.6	290.8	1,679	2,220
Aug.	....	298.0	....	2,119
Sept.	....	313.7	....	2,047
Oct.	....	307.1	....	1,913
Nov.	....	271.1	....	1,839
Dec.	....	266.6	....	1,809
Total	....	3,664.2		

American Institute of Steel Construction.

units, which would make it the best August since 1955. The cleanup of 1959s is going even better than most forecasters had anticipated.

The industry is planning to put 53 per cent of its assembly plants on two shifts to start the new model year, says *Ward's Automotive Reports*. That compares with only 26 per cent a year ago. The fourth quarter goal is 1,926,000 units, practically equal to the all-time high set in 1955. When you account for another factor (near capacity operations are anticipated in the steel industry once the strike is settled) it becomes certain that STEEL's industrial production record of 174 will be broken.

GNP to Be $483 Billion

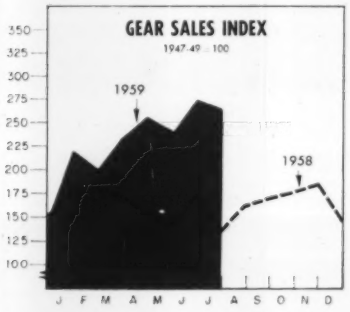
Standard & Poor Corp., following the example in motordom, has come out with a new "model" of the year's economy, placing the gross national product for 1959 at $483 billion compared with 1958's $441.7 billion. The new estimate includes a $495 billion (annual rate) fourth quarter and takes into account possible effects of the steel strike. While the second half rate of increase will be slowed down, it will still be a "healthy" advance. S&P figures on lower inventory accumulation and a leveling off in government spending to slow the pace. Expansion of construction and personal income may also slow down some.

With the close of the strike, the Federal Reserve Board's industrial production index will climb rapidly to the 160 (1947-49 = 100) area, yielding an annual average of 152. (The monthly record was 155 in June.)

Construction Peak Past?

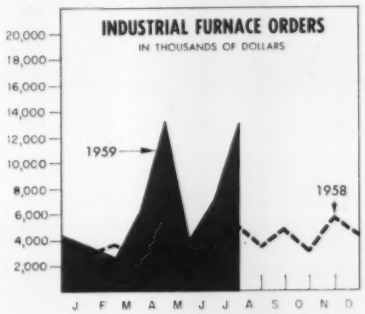
The construction industry continues to set records, but there are signs that this year's peak may be past. The government reports that work put in place last month set a record at $5.3 billion, but the increase over June's total was less than seasonal. For the first eight months of 1959, the total came to $35.7 billion, 15 per cent ahead of the corresponding figure for 1958. (For more on construction, see graph and table above.)

But contracts for future construction do not bode well. Awards in the week ended Aug. 27, at $293 million, were the lowest since the holiday-shortened week of Feb. 28, says *Engineering News - Record*.



	1959	1958	1957	1956
Jan.	218.6	174.5	259.3	245.5
Feb.	199 9	179.1	239.5	256.2
Mar.	234.3	173.7	262.4	276.5
Apr.	255.6	153.2	221.7	264.7
May	241.0	142.2	263.2	275.6
June	274.2	173 8	215.9	245.4
July	262.8	133.3	211.4	286.7
Aug.	....	162.1	225.8	219.5
Sept.	....	170.7	174.9	230.5
Oct.	....	175.9	207.0	299.8
Nov.	....	182.7	165.3	216.2
Dec.	....	145.5	150.8	235.7
Avg	....	163.9	216.4	254.4

American Gear Mfrs. Assn.



	1959	1958	1957
Jan.	3,518	3,047	8,775
Feb.	2 741	3,684	9,769
Mar.	6,146	2,871	10,485
Apr.	13.328	3,572	4,559
May	4,174	954	5,389
June	7,029	3,672	4,369
July	13,141	5,169	4,332
Aug.	....	3,533	3,924
Sept.	....	4 846	7,463
Oct.	....	3,105	3,674
Nov.	....	5,597	2,832
Dec.	....	4,284	3,992

Industrial Heating Equipment Assn. Inc.

That cuts the year-to-year cumulative gain from 5 per cent in the preceding week to 4 per cent.

Heavy construction firms are among the first outside of the steel producing industry to feel a squeeze from the strike. Both bookings and shipments dropped significantly in July, reports the American Institute of Steel Construction Inc. At 259,-131 tons, bookings slipped behind the year-ago month for the first time since May, 1958. (See table, Page 66.) The institute says: "While the decline in shipments can be largely attributed to the steel strike . . . 80 per cent of AISC members are still booking orders on jobs running up to 300 tons."

Appliances Going Strong

Makers of appliances aren't fearing the immediate consequences of the strike, but they have forebodings about their Christmas season if there is no settlement by October. This has been one of the best years on record for many appliance people. Producers of air conditioners are having the best model clean-up in many years. In a survey by the Federal Reserve Bank of Philadelphia, merchants report that "June, with its two severe heat waves, appears to have done for room air conditioners what the whole of last summer failed to do." And June was cool compared with July and August. Several manufacturers reportedly have sold out all 1959 models and are pushing 1960s to meet current demand.

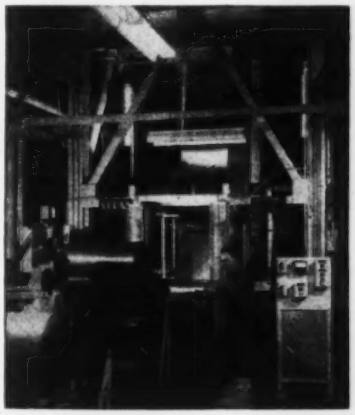
General Electric Co. says it is sold out of some low and medium price refrigerators because it underestimated the 1959 sales pickup.

In July, makers of automatic gas water heaters chalked up the seventh consecutive month in which sales improved over the corresponding 1958 totals, declares the Gas Appliance Manufacturers Association.

Trends Fore and Aft

- In the week ended Aug. 22, department store sales fell 1 per cent below the previous year's figure. Cause: Hot weather.
- During the first half, canmakers shipped 2.2 million tons, up 5.3 per cent from 1958's first half, says the Can Manufacturers Institute.
- Shipments by furniture makers in the first seven months of 1959 were at an annual rate of $2.66 billion, topping 1956's record by 4 per cent.

To meet demands for perfect finish on stainless and nickel Thinstrip®, Somers installs unique new annealing furnace.



This new Selas vertical continuous annealing furnace assures uncontaminated, commercially unmarred surfaces as well as uniform temper and faster delivery on stainless, nickel and nickel alloy Thinstrip up to 25" wide. But this is only part of the story of Somers' quality. Sendzimir rolling mills, Accu-Ray gauging plus 50 years leadership in thin gauge metals (from .010 down to .000125") are a few of the features Somers offers to assist you with your Thinstrip® problems.

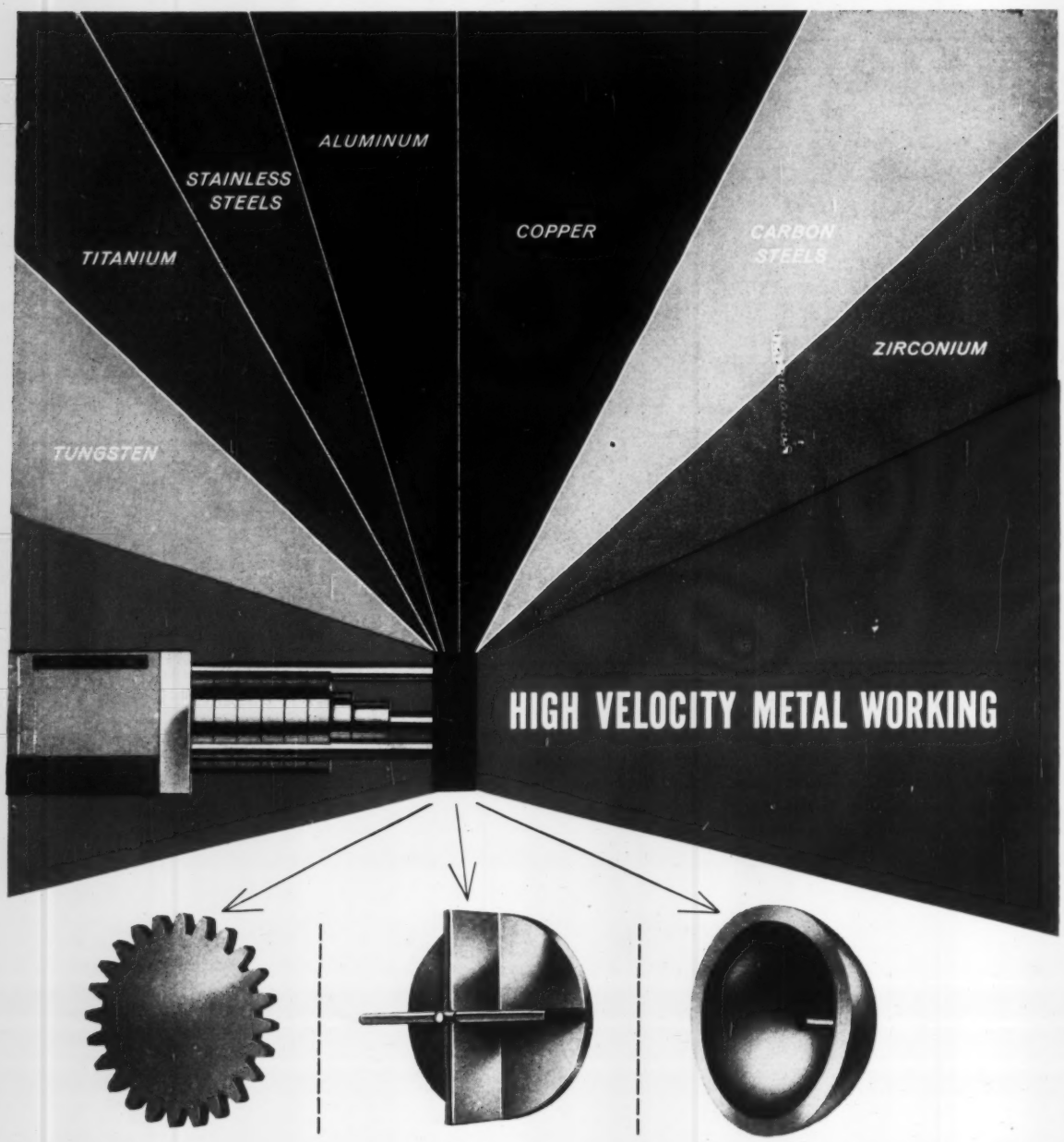
Write for Confidential Data blank — no cost or obligation.

FOR EXACTING STANDARDS ONLY

Somers

Somers Brass Company, Inc.

104 BALDWIN AVE. WATERBURY, CONN.



DYNAPAK—A NEW DIMENSION IN DESIGN AND PRODUCTION OF METAL PARTS

The ability of DYNAPAK high velocity metal working machine tools to forge, form or extrude intricate shapes to precision tolerances from common or high strength metals, offers new solutions for complex problems of design and manufacture.

THE DESIGN ENGINEER will find a new degree of freedom in design. He is no longer confined by the limitations of conventional forming techniques. He can now more nearly specify the ideal materials, shapes, and tolerances.

THE PRODUCTION ENGINEER can often accomplish, in a single operation and with simplified tooling, what would otherwise require multiple operations and complex tooling. With DYNAPAK, management can realize a substantial long-term advantage in capital investment.

Arrange today to evaluate DYNAPAK for your metal working operations. Write, wire or phone

DYNAPAK

CONVAIR / A DIVISION OF GENERAL DYNAMICS CORPORATION

1243 Transit Avenue, Pomona, California • Telephone: NAtional 3-1561

J. W. MAHONEY
Porter v. p. western region

DWIGHT A. BESSMER
Timken president

E. W. HANSEN
Allison Steel Mfg. post

EDWARD S. WRIGHT
Blaw-Knox div. v. p.

J. W. Mahoney was named vice president-western region, **H. K. Porter Company Inc.** He is at Los Angeles. He served Phillips Petroleum Co. for 13 years in sales, and was eight years with Gladding, McBean & Co., where he last served as executive vice president.

Arnold L. Boyce was appointed superintendent of Indox at **Indiana Steel Products Co.'s** new plant, Valparaiso, Ind. He formerly was with Ford Motor Co. as a metal powder engineer, and served as assistant superintendent in the Powdered Metal Dept. at Moraine Products Div., General Motors Corp.

Dermot W. Edmundson was made sales manager for **Micro-Path Inc.**, subsidiary of Topp Industries Inc., Los Angeles. He was with Electronic Controls Systems, division of Stromberg-Carlson Co.

J. W. Burgess was promoted to chief engineer for **American Zinc, Lead & Smelting Co.**, St. Louis, and all operating subsidiaries. He was manager of construction, Uranium Reduction Co., Moab, Utah. He has headquarters at the Fairmont City, Ill., division office.

At the Sand Springs, Okla., Works of **Sheffield Div.**, Armco Steel Corp., **W. J. Burcham** was promoted to assistant manager; **F. E. Dunn** to superintendent of the rolling mills.

A. E. Decker was made manager, eastern area, of the recently formed Defense Products Div., **Allis - Chalmers Mfg. Co.** He is in Washington.

Dwight A. Bessmer, executive vice president, **Timken Roller Bearing Co.,** Canton, Ohio, was named president to succeed **William E. Umstattd,** retired. Mr. Umstattd will continue to serve as chairman of the executive committee. **H. E. Markley,** vice president, succeeds Mr. Bessmer as executive vice president.

E. W. Hansen was appointed administrative manager, **Allison Steel Mfg. Co.,** Phoenix, Ariz. He was with Kaiser Steel Corp., since 1956 manager of planning and control at its Montebello, Calif., plant.

A. F. Miller Jr. fills the new post of sales manager, threading tools and gages, **Greenfield Tap & Die Corp.,** Greenfield, Mass. He is assisted by **Arthur J. Kelley,** chief field service engineer, on threading tools; and **Philip E. Bitters,** assistant sales manager, on gages.

Lamson & Sessions Co., Cleveland, appointed **Sterling P. Abbey** sales manager, Ohio Div.; **R. M. Casey** sales manager, Chicago Div.; **T. William Kelly** sales manager, eastern district; **R. G. Patterson Jr.** sales manager, central district; **Ray Burns** distributor sales manager.

Hercules Motors Corp., Canton, Ohio, named **J. G. Rongitsch** assistant to the director of manufacturing, **Keith D. Evans** manager of quality control. **Alfred A. Novelli** was placed on special assignment to the director of manufacturing. Mr. Rongitsch was assistant to the works manager of International Harvester Co.'s Louisville plant.

Edward S. Wright was appointed vice president-general manager, Power Piping Div., **Blaw-Knox Co.,** Pittsburgh. He succeeds **W. E. Parfitt,** resigned. Mr. Wright was vice president-construction, Chemical Plants Div. In his new post, he has general direction of sales, manufacturing, and construction activities.

David M. Checkley was named president of **Vitro Engineering Co.,** New York, division of Vitro Corp. of America. He was general manager, Industrial Engineering Div., Arthur G. McKee & Co., Cleveland.

John H. Nelson was made vice president-sales, **Kropp Forge Co.,** Chicago, a new post. He was works manager and vice president-manufacturing.

Ralph W. Morrison, vice president of **Aro Equipment Corp.,** was named executive vice president of the subsidiary, Firewel Co., Buffalo.

Spencer S. Phillips was made assistant manager, Iron Foundry Service, **Ohio Ferro-Alloys Corp.,** Canton, Ohio. He was technical director for Sibley Machine & Foundry Corp., South Bend, Ind.

John Plesa was made assistant chief metallurgist, **Weirton Steel Co.,** Weirton, W. Va., division of National Steel Corp. He succeeds **Harold Leuthke,** recently named chief metallugist at Midwest Steel Corp., the new plant National Steel is building at Portage, Ind.

John West was made eastern sales

WILBERT A. WALKER JOHN PUGSLEY
United States Steel financial executives

ANTON R. NOVY DR. ALBERT J. MUELLER
GLC associate directors of research

manager, **American Pulley Co.**, Philadelphia.

Wilbert A. Walker was appointed administrative vice president and comptroller, United States Steel Corp., Pittsburgh. He was vice president and comptroller. **John Pugsley** was elected executive vice president-accounting for the corporation, to succeed **George W. Rooney**, retired. Mr. Pugsley was administrative vice president-accounting.

Carra L. Lane was appointed manager of plant operations, **Chicago Pneumatic Tool Co.**, New York. All manufacturing and engineering operations at domestic plants at Utica, N. Y.; Franklin, Pa.; and Ft. Worth, Tex., are under his jurisdiction. In addition, he will co-ordinate operations at company subsidiaries. His headquarters are in New York. For the last three years, Mr. Lane has served as president and general manager, Security Engineering Div., Dresser Industries Inc. Prior association was with Walker-Turner Div., Kearney & Trecker Corp., as vice president-general manager.

Lyman D. Warner was appointed vice president-manager, contract and foreign operations, **Dresser Mfg. Div.**, Bradford, Pa., Dresser Industries Inc.

Henry S. Hall was named manager, Combustion Control Div., **Morgan Construction Co.**, Worcester, Mass. Former assistant manager, he is succeeded by **John J. Webber.** Mr. Hall succeeds **Strickland Kneass Jr.** who was made consultant to the company. **Warren H. Howard** was made Pittsburgh district managing representative; **Samuel S. Rickley** chief engineer, Morgoil Bearing Dept.

John M. Bals was made general manager, **Aurora Pump Div.**, Aurora, Ill., New York Air Brake Co. He succeeds **Frank S. Main**, who relinquishes the post due to health reasons. Mr. Bals was division sales manager. Mr. Main will serve as a consultant.

Anton R. Novy and **Dr. Albert J. Mueller** were made associate directors of research for **Great Lakes Carbon Corp.**, and are at the Morton Grove, Ill., research center. Mr. Novy will specialize in programs related to GLC's carbon and graphite products. Dr. Mueller will engage in programs related to nonmetallic mineral products, such as diatomaceous earth and perlite.

Walter P. Cartun was made general manager of **General Electric Co.'s** Miniature Lamp Dept., Cleveland. He succeeds **Kenneth G. Reider**, retired.

James E. Bevan was made New York district sales manager for **I-T-E Circuit Breaker Co.** He succeeds **John H. Kuhns**, retired.

Richard T. Brown was appointed manager of the **Oliver Corp.** plant in South Bend, Ind., to succeed **C. W. Shider** who retires Sept. 30. He was production superintendent.

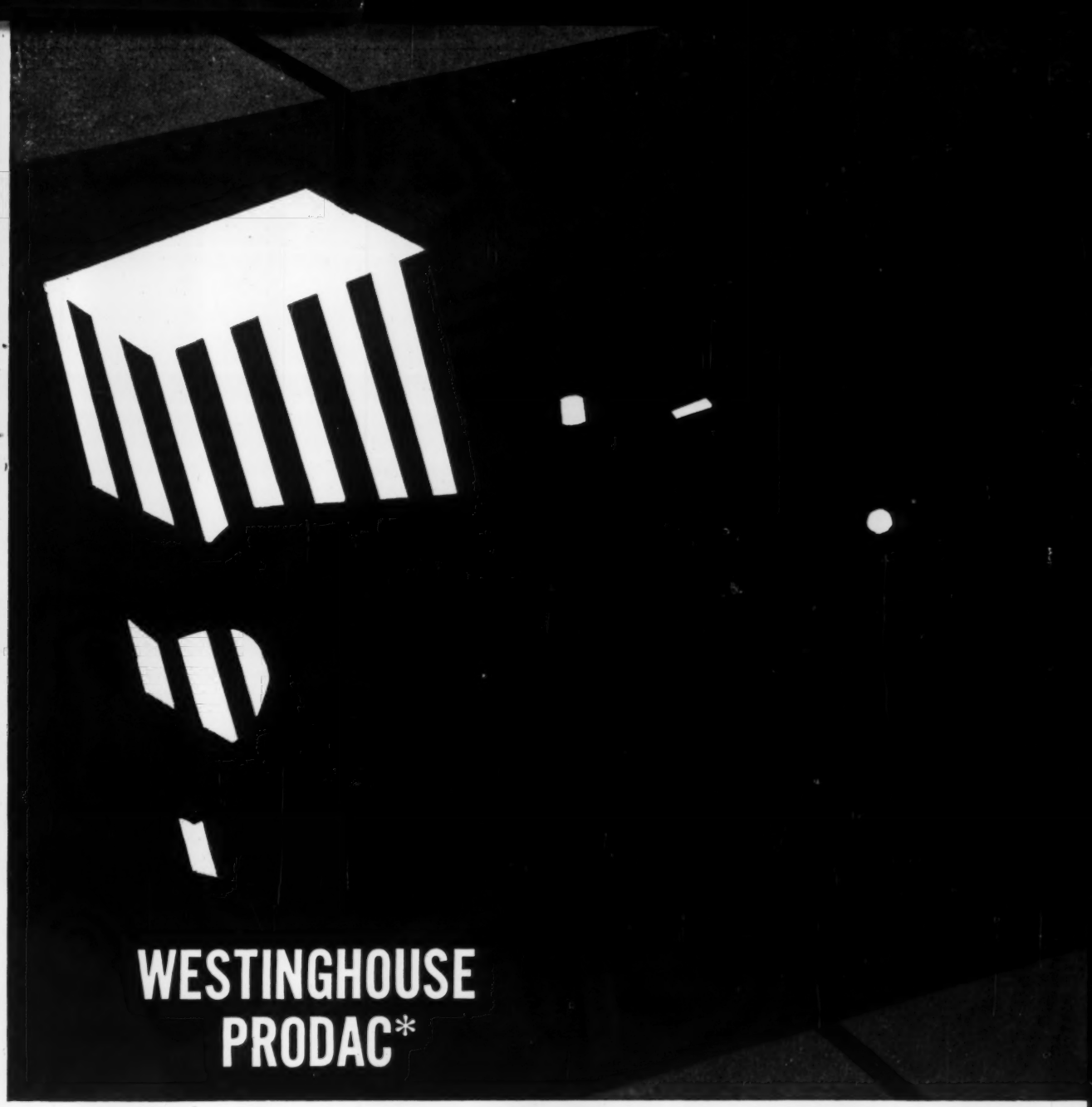
William J. Elperin was made St.

CARRA L. LANE
joins Chicago Pneumatic Tool

HENRY S. HALL
Morgan Construction div. mgr.

JOHN M. BALS
Aurora Pump gen. mgr.

RICHARD T. BROWN
Oliver plant manager



WESTINGHOUSE PRODAC*

means automatic ingot buggy operation

. . . automatic cycling of ingot buggies and transfer cars . . . coordinated with sequencing of ingot buggy calls to the selected soaking pits . . . stopping accuracy of plus or minus one foot at the pits . . . no limit on number of stopping positions . . . remote control possible from any number of stations. This is but one of many ways Westinghouse PRODAC† is helping bring about the "mill of the future" today through completely automatic ingot buggy operations.

Westinghouse has service-proven PRODAC installations that economically automate slabbing mills, blooming mills, reversing roughers, stock house materials handling and many other mill applications.

By specifying Westinghouse PRODAC for your mill, you open the door to many new cost-saving benefits which are unobtainable with conventional controls. For example, PRODAC assures the most consistent standards of quality control at the highest rates of production speed . . . coordinates operation of all machines at the over-all maximum efficiency . . . holds maintenance to a minimum, and practically eliminates control failures . . . gives you a "building block" design which provides flexibility required for further mill automation.

The entire team of Westinghouse PRODAC engineers is at your service to help you determine exactly where and how PRODAC can benefit you. Your Westinghouse sales engineer can give you complete information, or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-22113

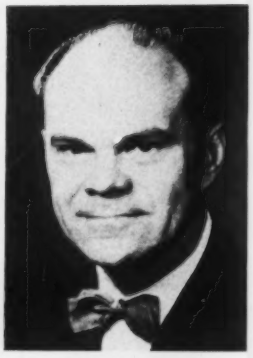
*PROGRAMMED DIGITAL AUTOMATIC CONTROL
†Trade-Mark

YOU CAN BE SURE...IF IT'S Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV FRIDAYS

FRANK M. JENNER
Consolidated Vacuum pres.

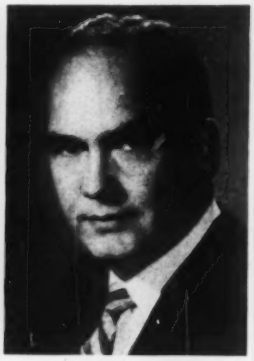
JAMES DOWD
Garlock Packing post



E. M. SCHEIFFLER
Macklin purchasing dir.

WALTER J. RAINER
Minneapolis-Moline marketing

H. A. CURWEN
Jorgensen tech. dir.



C. THORPE THOMPSON
joins Sheffield Corp.

Louis office manager, **Clark Controller Co.**

Walter J. Rainer, assistant manager, Parts Div., **Minneapolis-Moline Co.,** Hopkins, Minn., was promoted to manager of marketing services.

H. A. Curwen was appointed technical director for **Earle M. Jorgensen Co.,** Los Angeles. He has been with Jorgensen since 1946.

Jack & Heintz Inc., Cleveland, elected **H. Chapman Rose** acting chairman, **Chester A. Thompson** acting president, to hold these posts until a permanent successor to the late **Frank R. Kohnstamm** is elected president. Messrs. Rose and Thompson are directors of J&H.

L. F. Bonofiglio was appointed wire mill superintendent at the South San Francisco plant of **Colorado Fuel & Iron Corp.'s** Pacific Coast Div. He was superintendent of industrial engineering for the Pacific Div.'s Oakland, Calif., and San Francisco plants.

C. Thorpe Thompson, former president of Cleveland Instrument Co., was named vice president and general manager, **Sheffield Corp.,** Dayton, Ohio, subsidiary of Bendix Aviation Corp. **W. Fay Aller** was promoted to vice president-engineering.

Joseph A. Hohenleitner was made sales manager, Continental Boiler Div., **Boiler Engineering & Supply Co. Inc.,** Phoenixville, Pa. He was assistant sales manager for the company. **Maurice W. Williams** will supervise the newly formed Flo-Kontrold HTW Boiler Div.

Thomas D. Williams was made manager of the Minneapolis district sales office of **I-T-E Circuit Breaker Co.** He succeeds **John J. Sedlacek,** recently made Philadelphia district office manager.

John Skibicki was named assistant superintendent of fabrications at the Claymont, Del., plant of Colorado Fuel & Iron Corp.'s **Wickwire Spencer Steel Div.**

The Rochester, N. Y., Div. of **Consolidated Electrodynamics Corp.,** begins operations Oct. 5 as **Consolidated Vacuum Corp.,** a subsidiary of CEC. **Frank M. Jenner** was elected president of the new firm, **Philip S. Fogg** chairman. Mr. Jenner was manager, Vacuum Equipment Dept., Distillation Products Industries, a division of Eastman Kodak Co. He became vice president-general manager of Consolidated Vacuum Corp. when the DPI unit was purchased by CEC and established as a subsidiary in 1952, and was named general manager when the subsidiary became a company division in 1953. Mr. Fogg is president and chairman of CEC.

James Dowd was appointed manager of marketing research, **Garlock Packing Co.,** Palmyra, N. Y. He was assistant manager, Market Development Dept., Air Reduction Sales Co.

E. M. Scheiffler was made director of purchases for the Jackson, Mich., and Canadian plants of **Macklin Co.**

Dale W. Patrick was made sales manager, **Pittsburgh Pipe & Coupling Co.,** Allison Park, Pa., and its subsidiary, **Anvil Products Inc.,** Longview, Tex. **George E. Lourie** was made interplant administrator. Mr. Patrick was assistant vice president-sales, Screw & Bolt Corp. of America.

OBITUARIES...

Paul R. Turner, 65, former sales director for **General Motors Corp.'s** Electro-Motive Div., McCook, Ill., died Aug. 24.

Richard J. Hoar, 60, superintendent, Finishing Departments, Buffalo district, **Republic Steel Corp.,** died Aug. 17.

Joseph H. Hartman, 59, retired vice president, **Craft Metal Spinning Co.,** Dundee, Ill., died Aug. 24.

G. Lloyd Comfort, 58, contracting manager for the New York district sales office of **Bethlehem Steel Co.,** died Aug. 26.

Arthur F. Thormahlen, 43, president, **Niagara Industrial Designers Inc.,** Buffalo, died Aug. 22.

Here, boiling nitric acid is used to evaluate the corrosion resistance of Jessop stainless steel plate.

"How Jessop Tests Stainless Steel in Boiling Nitric Acid"

L. W. Cooper, Chief Metallurgist

"From experience, our customers know this is a fact: Specify Jessop for specialty steels . . . and then relax! Of the many reasons *why* this is true, here's one . . .

"In evaluating corrosion resistance, one of the procedures we use is the ASTM boiling nitric acid test. Standard and simple? Yes. But expert *evaluation* is of great importance to the customer. That's why, at Jessop, a top metallurgist closely supervises each of the five 48-hour test periods.

"*Overly cautious?* Because we're overly cautious in *every* phase of steel production and quality control, Jessop has earned the reputation for producing specialty steels tailor-made to the most exacting specs—*Specify Jessop . . . and then relax!*"

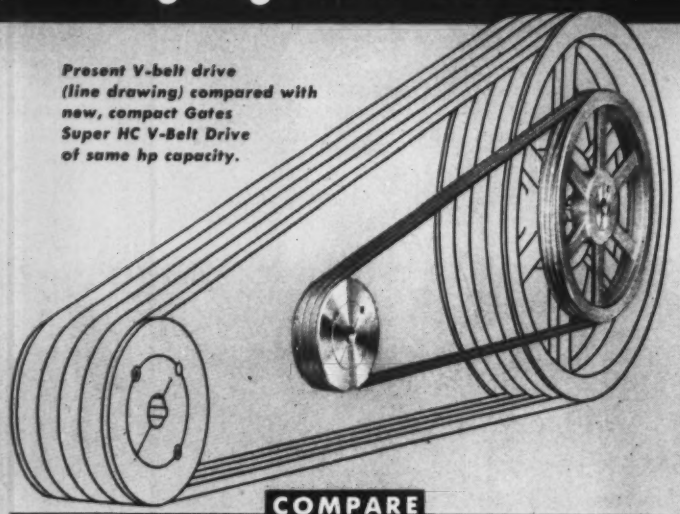
Checking the grain size of tool steel, this Jessop metallurgist uses a microscope with a camera attachment. VMA 6787

Green River Steel Corporation
Jessop Steel of Canada, Ltd.
Jessop Steel International Corporation
Steel Warehousing Corporation, Chicago

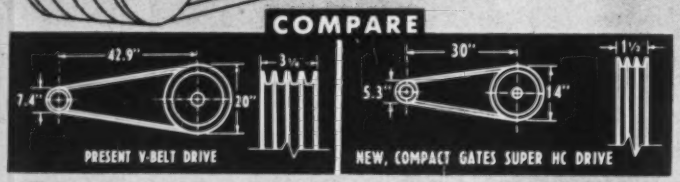
JESSOP
STEEL COMPANY
Washington, Pennsylvania

Stainless, alloy, tool, cast-to-shape, clad, and forging steels, ground flat stock and other specialty steels

Designing NEW DRIVES?



Present V-belt drive (line drawing) compared with new, compact Gates Super HC V-Belt Drive of same hp capacity.



Save up to 20%

with new high capacity V-belt drive

When you change the whole drive — both V-belts and sheaves — remember: The cost of a Gates Super HC V-Belt Drive is as much as 20% less than the cost of present V-belt drives of the same horsepower capacity.

A development of Specialized Research in the world's largest V-belt laboratories at Gates, the new Super HC V-Belt makes possible the most compact, lightest-weight, lowest-cost multiple V-belt drive you can put on any machine!

Cuts drive space as much as 50%

With Gates new Super HC V-Belt, sheave diameters and widths can be reduced 30% to 50%, center distances 20% and more. Bearing load is lightened and total space occupied by the drive may be cut as much as 50%.

"The Modern Way to Design Multiple V-Belt Drives" is an informative handbook on the Super HC Drive, available from your nearby Gates Distributor listed in the Yellow Pages of your phone book.

The Gates Rubber Co., Denver, Colorado
Gates Rubber of Canada Ltd., Brantford, Ont.
World's Largest Maker of V-Belts

TPA 439

Gates SUPER HC V-BELT Drives

R. R. Bearingmakers Up Plant Capacities

TIMKEN ROLLER Bearing Co., Canton, Ohio, will build a second railroad bearing production line in its Columbus, Ohio, plant. Cost: $5,250,000 vs. more than $7 million for the first such line, built in '58.

The new unit will be capable of equipping 20,000 freight cars a year with "AP" railroad bearings, duplicating the capacity of the present production line.

Equipment for the new facility will be ordered immediately, says A. L. Bergstrom, vice president of engineering. The line will be in operation by the fall of 1960.

Timken officials estimate that railroads can save about $288 million a year, or $144 a car, in operating and maintenance costs when all freight cars are equipped with tapered roller bearings.

• **Norma-Hoffmann Bearings Corp.** —A 50 per cent expansion in capacity to produce railway traction motor bearings is underway, says R. L. Miller, vice president in charge of sales. Machinery and equipment orders have been placed and increased production schedules will begin in January.

Norma-Hoffmann makes a cylindrical roller bearing used to support traction motors of diesel-electric and electric locomotives.

Pittsburgh Coke Expands

Pittsburgh Coke & Chemical Corp. is expanding its activated carbon plant at Neville Island, Pa. Fluor Corp. Ltd., Los Angeles, has been commissioned under a subcontract from its New York affiliate, Singmaster & Breyer Inc., to install new production equipment and to modify existing facilities.

Agglomeration Tests Begin

Allis-Chalmers Mfg. Co. Milwaukee, has started operations at its new process pilot plant at Carrollville, Wis. The tests are expected to solve many problems regarding agglomeration, heat treating, or processing of a wide range of raw materials. Magnetite and hematite concentrates, natural fine

iron ores, silicious bauxite, magnesite, cement, phosphate ores, dolomite, and limestone are among materials scheduled for intensive study and evaluation on both a process and economic basis.

Keller Machine Expands

J. & A. Keller Machine Co. Inc., manufacturer of automated machinery and experimental equipment for the missile, aircraft, and atomic industries, is expanding its plant at 2320 Military Rd., Tonawanda, N. Y. The 10,000 sq ft addition will be used for assembly work.

Plans $30 Million Project

Olin Mathieson Chemical Corp., New York, has completed plans for a $30 million expansion program in organic and inorganic chemicals. The program includes: Construction of new production facilities and expansion of existing facilities at its Brandenburg, Ky., plant; construction of a new facility to produce sulfamic acid at Joliet, Ill.; and improvement of chlorine production facilities at Niagara Falls, N. Y.

Forms Detinning Div.

Metal & Thermit Corp., New York, has established a Detinning Div. J. K. Parks will be general manager. Responsibilities will include operation of the detinning plants at Carteret, N. J., East Chicago, Ind., and South San Francisco, Calif. G. L. McCauslan is divisional production manager; Ralph Mason, manager of metal scrap procurement and sales. Plant managers are: R. Goodrich, Carteret; G. Bradbee, East Chicago; and D. B. Read, South San Francisco.

Reynolds Metals Expands

Sunbeam Equipment Corp., Meadville, Pa., has started erection of ten aluminum coil annealing furnaces for the alloys plant of Reynolds Metals Co. near Sheffield, Ala. The furnace will accommodate 150,000 lb of aluminum coils.

In addition to this project, Reynolds plans to expand its dock and

(*Please turn to Page* 78)

Improved Gates Vulco Rope gives you 2 important advantages

1. 40% higher hp rating at no increase in price: This important cost-saving advance is the result of Specialized Research in the world's largest belt-testing laboratories at Gates. **As replacements on standard drives these V-belts with 40% more load-carrying ability give longer service life...reduce down-time, cut belt replacement costs.**

2. Concave Sides (U. S. Pat. 1813698): The sides of Gates Belts are concave (Fig. 1). When the belt is bent around the sheave, the concave sides fill out—become straight—for full, uniform contact with the sides of the sheave groove (Fig. 2). Uniform contact insures maximum pulling power...even distribution of wear...longer life.

Available in all sizes from your nearby Gates V-Belt Distributor listed in the Yellow Pages of your phone book.

When designing new drives
use Gates new Super HC V-Belts and Sheaves.
See opposite page.

The Gates Rubber Co., Denver, Colorado
Gates Rubber of Canada Ltd., Brantford, Ont.

World's Largest Maker of V-Belts

TPA 432

Gates Hi-Power VULCO ROPE V-Belts

Which would you rather

American Steel & Wire supplies Heavyweight Coils—in weights up to 2,000 pounds—to any customer who can effectively apply their time-, space-, and money-saving qualities. There is no price extra for this special coil.

When you order your wire in large 2,000-pound coils, you save three different ways:

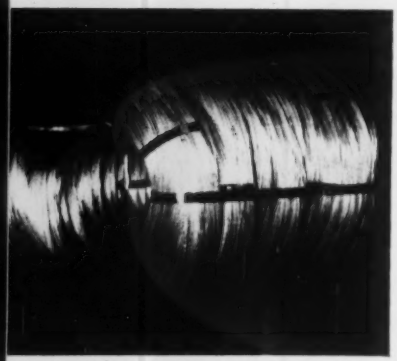
You cut down on handling time and cost. You have only one coil to move in place of 5 or more smaller ones.

You save on storage space. One 2,000-pound coil takes up less storage space than five 400-pound coils.

You save on costly, time-consuming down time. Your machines are shut down once instead of 5 or more times.

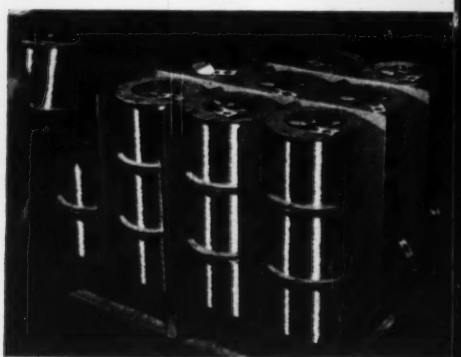
USS **American Manufacturers Wire**

Other important time- and space-saving AS&W



UNITIZED COILS—
Several regular mill coils bound in one unit to speed up handling and save storage space. Unitized coils carry no price extra!

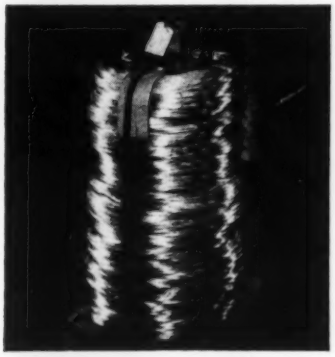
PAY-OFF DRUMS—
Large, fibre, disposable drum containing long continuous coil. Pay-Off Drum is easy to handle and stack, protects wire finish from dirt and corrosive atmospheres.



DISPOSABLE SPOOLS
Contains from 5 to 65 pounds of fine wire. These non-returnable spools are convenient to handle and stack. Where wire is needed in large quantities, they can be shipped 36 spools on a pallet.

THIS?
One Heavyweight
coil—
TOTAL WEIGHT
2,000 POUNDS

WIRE PACKAGES:



PLATFORM COIL CARRIER

This disposable unit is made of U-shaped wire frame attached to deck platform; holds up to 3,000 lbs. of wire in continuous lengths.

All of these new American Steel & Wire Packages are planned to serve you better, to help you use warehouse space to better advantage, to save time and money.

For more information, get in touch with the nearest district office of American Steel & Wire. General Offices: American Steel & Wire, 614 Superior Avenue, N.W., Cleveland 13, Ohio.

USS and American are registered trademarks

American Steel & Wire Division of United States Steel

USS

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors • United States Steel Export Company, Distributors Abroad

Outer space has its problems and its specialists. But for those concerned with moving things through the *inner* reaches of a plant or factory, there is no better source than "The Man from Logan."

As your field engineer for Logan Conveyors, he must qualify with a strong academic background, years of home-office and field engineering work, and a good command of Logan's two generations of experience as a leading conveyor company.

In addition to these personal qualifications, "The Man from Logan" calls on any assistance needed from a progressive research and development staff and an eminently qualified home-office engineering force. And, of course, Logan's resources of materials and components are unsurpassed in the industry.

To you, then, "The Man from Logan," comes as the convenient and completely dependable source for the one best custom-designed conveyor system for any need. You need only to call him in. His broad experience further assures you that costs will be kept as low as is feasible. Write or phone today for a visit from "The Man from Logan."

Logan Conveyors

LOGAN CO., 535 CABEL ST., LOUISVILLE 6, KY.

(*Continued from Page 75*)

loading facilities at its Sherwin alumina plant near Corpus Christi, Tex. Estimated cost: More than $1 million.

Enlarges Manganese Plant

Foote Mineral Co., Philadelphia, will expand its electrolytic manganese facilities by enlarging the larger of its two Knoxville, Tenn., plants. The expansion, which will increase the plant's capacity 30 per cent, is the first step of a major program necessitated by the growing demand for electrolytic manganese in stainless and mild steels.

The company also has broken ground for its $2.2 million research and engineering building near Exton, Pa. The 53 acre research and engineering center has been under development since 1957.

Opens Plant in Scotland

Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., and Douglas Fraser & Sons Ltd., Arbroath, Scotland, have formed a British company, Giddings & Lewis-Fraser Ltd. The U. S. firm owns controlling interest. The new company acquired the manufacturing facilities of Douglas Fraser & Sons Ltd., known as the Engineering Div. It will continue to produce automatic hydraulic milling and centering machines, automatic production milling machines, multispindle drilling machines, and machine tool components. It will also make Giddings & Lewis table type horizontal boring, drilling, and milling machines with 3, 4, and 5 in. spindles for foreign markets.

Aluminum Firm Expands

Fairmont Aluminum Co., a subsidiary of Cerro de Pasco Corp., New York, is increasing the annual capacity of its Fairmont, W. Va., aluminum rolling mill from 25 million to 66 million lb of finished aluminum coiled and flat sheet products up to 60 in. wide. Cost of this first step in a multimillion dollar program is estimated at $10 million, including provision for additional working capital. The overall program contemplates a subsequent stepup in productive capacity to 120 million lb. Principal work

DoALL

ECONOMY SPECIAL

BLADE-TYPE COUNTERBORE SET

Here's another DoALL exclusive—another money-saver for you! It's this new blade-type counterbore set—"Econo-Bore"!

Now, with only five shanks, ten interchangeable blades and seven pilots, you get over 30 different size combinations. And you can reduce your tool costs far below the cost of conventional solid or removable pilot type counterbores.

And here's still more good news! "Econo-Bores" can easily be modified to specials. The high-speed steel blades can be replaced for only $1.50—single screw adjustment.

"Econo-Bore" Set No. D-25, complete in hardwood case . . . also available in individual sizes. Get yours today—call your local DoALL Store.

DoALL Quality
DoALL Guaranteed
Only
$40.50

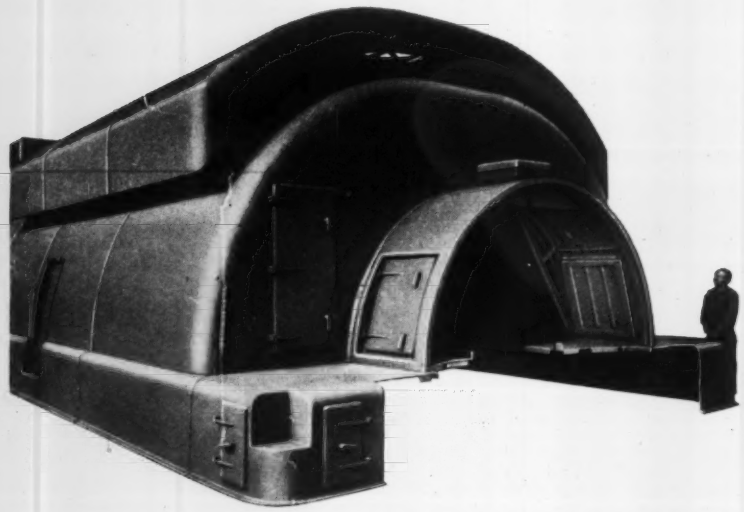
Look to DoALL for new and better tools — all laboratory-inspected and guaranteed.

IN STOCK

AT YOUR LOCAL DoALL STORE

all laboratory inspected

THE DoALL COMPANY
DES PLAINES, ILLINOIS



FOR CUSTOM FABRICATION

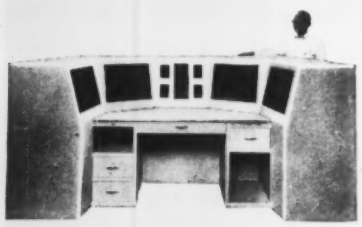
SPECIFY *Kirk and Blum*

What is the most economical way to fabricate your components? Ask Kirk & Blum . . . a firm that, for more than 50 years, has maintained the confidence of the nation's outstanding manufacturers with substantial savings in time and cost.

Kirk & Blum's experienced craftsmen are adept at a multiplicity of production techniques for maintaining quality and uniformity at lowest cost. Often, they develop special tooling that opens new vistas of economy.

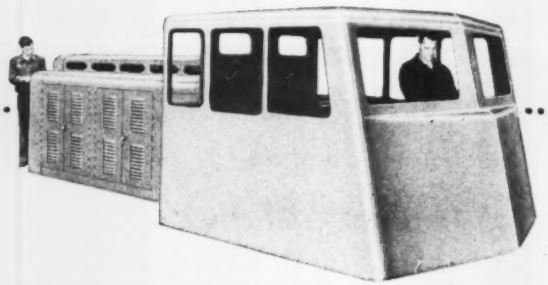
The extensive facilities and equipment of Kirk & Blum's 170,000 sq. ft. plant offer a capacity for sheet steel fabrication to ½" thickness. Working with aluminum, copper, monel, stainless and other alloys is a K&B specialty.

Request your copy of the new 40-page Kirk & Blum Sheet and Plate Fabrication Catalog. Better yet, send us your prints for prompt quotation.



THE KIRK & BLUM MANUFACTURING CO.

3226 FORRER STREET • CINCINNATI 9, OHIO



underway on the cold finishing facilities is the installation of a two stand, 77 in., four high, rolling mill and a single stand, 77 in., four high, rolling mill.

Expands Steel Shot Plant

Cleveland Metal Abrasive Co., Cleveland, is erecting a 16,000 sq ft addition to its plant at a cost of $350,000. It will house an electric melting furnace producing 12,000 tons of finished steel shot a year. Other equipment to be installed will include conveyors, heat treating furnaces, tanks, crushers, and testing machines.

H & B American Renamed

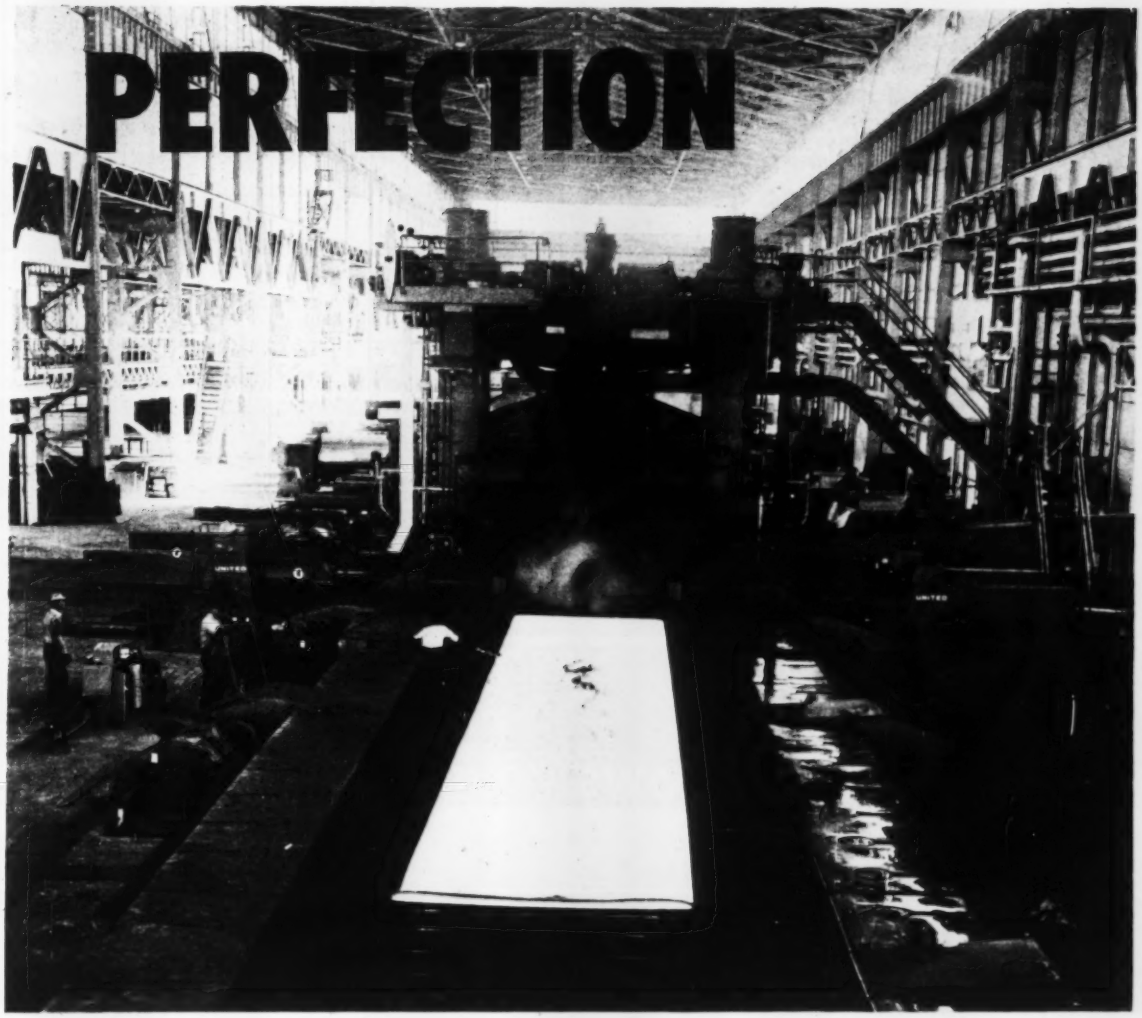
H & B American Machine Co. Inc., Los Angeles, changed its name to H & B American Corp. The company operates four divisions: Willard Woodrow Construction Co., Big Boy Mfg. Co., General Trading Co., and Quick Way Truck & Shovel Co. The latter is a joint venture with Fairbanks-Whitney Corp., New York. H & B American has sold its Aircraft Div. to United States Chemical Milling Corp., Manhattan Beach, Calif.

Expands Platinum Works

J. Bishop & Co. has completed the first stage of a multimillion dollar expansion program at its Platinum Works, Malvern, Pa. The first stage included erection of a mill containing 161,920 sq ft of manufacturing and office space. It houses redrawing facilities for small diameter stainless steel, nickel and nickel alloy, super and exotic tubing in mechanical, aircraft, capillary, and hypodermic grades. It also houses Design, Engineering, and Production Departments, the metallurgical laboratory, and the Receiving and Shipping Departments.

The next step will be the completion of a second story to the building to house the company's general offices, hypodermic tubing manufacture, the manufacture of tubular fabricated parts, and spinnerette fabrication for the synthetic fiber production.

The plant erected in 1951 will be the home of the Platinum Fabrication Div., adding some 33,600 sq ft to its present facilities The Plat-



Fuji's modern 160" plate mill

From Pig to Finished Products

FUJI IRON & STEEL CO., LTD., a giant among Asia's steelmakers, has made vast strides towards achievement of perfection in all phases of iron and steel production. FUJI STEEL products can be depended upon because rigid control is maintained over quality at all essential points.

FUJI IRON & STEEL CO., LTD.

Cable: STEELFUJI TOKYO

Head Office
Tokyo, Japan

New York Office
Room 805, 52 Broadway
New York 4, N.Y.
United States of America

European Office
Graf-Adolf Str. 86/88
Dusseldorf
Germany

Let's Get to the Bottom of it!

A Sterling COSTS LESS!

Sterlings are so ruggedly constructed, they easily outlast any wheelbarrow on the market. Their long service life protects your initial investment...cuts depreciation to a minimum. Meanwhile, maintenance costs are nil. We invite comparisons. On the basis of total cost per year . . . *and that's the sensible way to figure wheelbarrow costs* . . . Sterlings cost less than any other barrow. Write today for catalog.

Carefully examine a Sterling — the tray, braces, wheel, legs, handles. You'll find it's engineered to take hard punishment for YEARS.

STERLING NATIONAL INDUSTRIES, INC.
Milwaukee 14, Wisconsin, U. S. A.

Look for this mark of Sterling quality.

Sterling WHEELBARROWS

A9-4512

SURPRISE IN CHICAGO

You should know these surprising facts about Chicago's incomparable Drake Hotel before you schedule your next meeting—large or small . . .

1. While The Drake is one of America's most distinguished hostelries, it doesn't cost one cent more than other leading hotels to headquarter your meeting here.
2. The Drake is "alive." Meetings go like clockwork and everyone enjoys the warm, hospitable service in a setting of luxuriant comfort.

DICK FLYNN
V. P.—Sales

Now $8,000,000 new! No hotel in the midwest can match The Drake for unsurpassed convenience, location, facilities. 4 major meeting rooms accommodating up to 800, plus 16 committee rooms for functions of 12 to 300. 700 guest rooms. 100% air conditioned. Phone or write today for free brochure.

The Drake HOTEL
LAKE SHORE DRIVE AND UPPER MICHIGAN AVENUE
SUPERIOR 7-2200 • TELETYPE NO. CG1586

inum Chemical Dept., encompassing the refinery, recovery, and analytical laboratory operations will remain in its present plant in Malvern, adding the former platinum fabrication space to its operation.

Steel Fabricator Expands

Dayton Fabricated Steel Co. plans to erect two buildings in Dayton, Ohio. The first will be a $50,000 warehouse and maintenance building providing 5500 sq ft. The second building will provide 9800 sq ft of storage space.

GE Shifts Control Unit

General Electric Co., Schenectady, N. Y., is transferring its resistance welding control business to Detroit from Waynesboro, Va. The company's Service Shops Dept. through its Detroit operation at 5950 Third Ave. will engineer, manufacture, and market all GE controls for resistance welding applications and will handle renewal parts and repair. Responsibility for advanced engineering of the line also is being transferred to Detroit.

Forms Brazilian Unit

Johnson Bronze Co., New Castle, Pa., organized Johnson Bronze do Brasil with manufacturing facilities in Rio de Janeiro, Brazil. The firm produces bearings and bushings. The new company results from a joining of Johnson Bronze International Inc. with the partners of SinteRosa Auto Pecas Ltda.

Niles Firm Gets Contract

Mallory-Sharon Metals Corp., Niles, Ohio, has been authorized by the Department of Defense to carry out sheet rolling programs on two high strength titanium alloys: MST 881 and MST 7-12. Both alloys exhibit high strength characteristics for long periods at 1100° F.

Mallory-Sharon also has been awarded a contract by the Air Materiel Command at Wright-Patterson Air Force Base, Ohio, to build a prototype cold mold crucible for induction melting. The contract calls for construction and testing of a 14 in. diameter induction furnace with a water cooled crucible for

melting reactive metals, such as titanium.

Bridgeport Renews Lease

Bridgeport Brass Co., Bridgeport, Conn., has renewed its lease on the U. S. Air Force owned plant at Adrian, Mich., where the company makes aluminum forgings, extrusions, rods, and tubes.

Universal Grinding Builds

Universal Grinding Co., Cleveland, is adding 27,000 sq ft to its present 23,000 sq ft plant. The company is producing at a rate of about 200,000 pieces daily (about $100,000 a month dollar volume). Universal offers facilities of some 90 production pieces.

Kennecott Awards Contract

Western-Knapp Engineering Co., San Francisco, has been awarded a contract to engineer part of a proposed $10 million improvement and modernization program at Kennecott Copper Corp.'s Utah Copper Div. smelter. The contract covers proposed studies encompassing conversion of a preroasting process to a direct smelting process, modernization of the material handling system, enlargement and modernization of the three reverberatory furnaces, and installation of new waste heat boilers.

Expands Ferroalloy Plant

Pittsburgh Metallurgical Co. Inc., Niagara Falls, N. Y., will install additional production facilities, build a power substation and make other improvements at its plant in that city. Initially, a large, three phase, submerged arc, ferroalloy furnace will be installed. Later, a second large, submerged arc furnace and possibly a tilting furnace may be added. Auxiliary equipment for the handling of raw materials and finished products will be included in the project.

A new furnace is also under construction at the company's Calvert City, Ky., plant and some of the existing furnaces there are being adapted to enlarge their capacity. Productive capacity of the plant will be increased about 20 per cent.

Pittsburgh Metallurgical's sales

interchangeable with all standard JIC cylinders

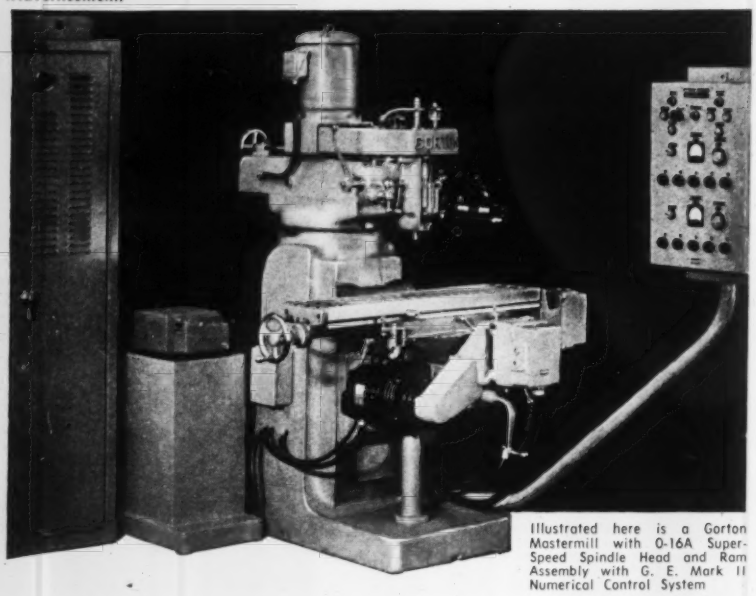
With the introduction of the ALL NEW T-J Squair Head, Tomkins-Johnson now offers industry the most complete design range of air and hydraulic cylinders. Presently available in bore diameters from 1-½ to 8 inches, the T-J Squair Head is an interchangeable cylinder which produces maximum force and efficiency, with minimum pressures . . . and is also adaptable to the use of low pressure oil as the working medium. Write today to The Tomkins-Johnson Co., Jackson, Michigan, for Bulletin #SQ 10-58 and complete details.

CHECK THESE 10 POINTS OF T-J SUPERIORITY

1. One Piece Piston
2. Hard Chrome Cylinder Bore and Piston Rods
3. High Tensile Steel Tie-Rods
4. Cushion Adjusting Screw, Externally Adjustable
5. New Super-Cushion for air, or Self-Aligning Master Seal for oil (T-J Patents)
6. Solid Steel Heads and Mounting Plates Standard all Models
7. Port Design Allows Minimum Pressure Drop on Inlet or Outlet
8. Chevron Type, Self-Adjusting Rod Packing
9. Piloted Packing Gland—Absolute Alignment
10. Piston Rod, Extra Strong—Polished and Chrome Plated for Efficiency and Protection

T-J TOMKINS-JOHNSON
RIVITORS . AIR AND HYDRAULIC CYLINDERS CUTTERS CLINCHORS

(Advertisement)



Illustrated here is a Gorton Mastermill with 0-16A Super-Speed Spindle Head and Ram Assembly with G. E. Mark II Numerical Control System

Numerical Control Cuts Short-Run Milling Costs

Requirements of the machining problem determine the type of control

One of the truly fascinating aspects of numerical control is the way in which it changes the "impossible" into the possible . . . usually at a high profit. For instance; remarkable savings have been obtained in the production of "headache" parts, in ability to machine "out of reach" work areas, in maintenance of uniform tolerances on complicated interchangeable components, and in the elimination of waste, rejects, and high inspection costs.

Numerical control is especially suitable wherever design of parts is beyond manual control or multi-tooling capabilities, or where parts are too small to see or too large to comprehend. It is ideal when flexibility is required throughout the entire operation, or when machining requires continuous inspection.

Selecting the right control is the key to profitable operation. The control should be custom-fitted to the machine. This is particularly important in short-run applications because it is here that the greatest economies are obtainable.

The photo above illustrates a Gorton Mastermill Model 1-22 which is "custom-tailored" to numerical control for short runs . . . with built-in transverse and longitudinal table movements and vertical spindle travel. Positioning information increment can be as low as .001 with cycling up to 20 per minute. This machine, if suitable to your requirements, can bring you remarkable production economies.

Further and complete information may be obtained on letterhead request to George Gorton Machine Co., 2005 Racine St., Racine, Wis.

to the steel industry during the fiscal year ended June 30, 1959, were about 30 per cent higher than in any prior year in the company's history.

NEW ADDRESSES

American Machine Tool Distributors' Association moved its headquarters offices to 1500 Massachusetts Ave. N.W., Washington 5, D. C.

Federal Sign & Signal Corp. moved its general offices and Chicago production operations to 136th Street & Western Avenue, Blue Island, Ill.

NEW OFFICES

Aluminum Co. of America, Pittsburgh, established a resident sales office at 901 National Bank Bldg., Lima, Ohio. G. B. Seifried is resident representative.

Brook Motor Corp., Chicago, opened a branch office at 509 Fifth Ave., New York 17, N. Y. John J. O'Donnell is branch manager. The New York a. warehouse will continue to be at Jersey City, N. J.

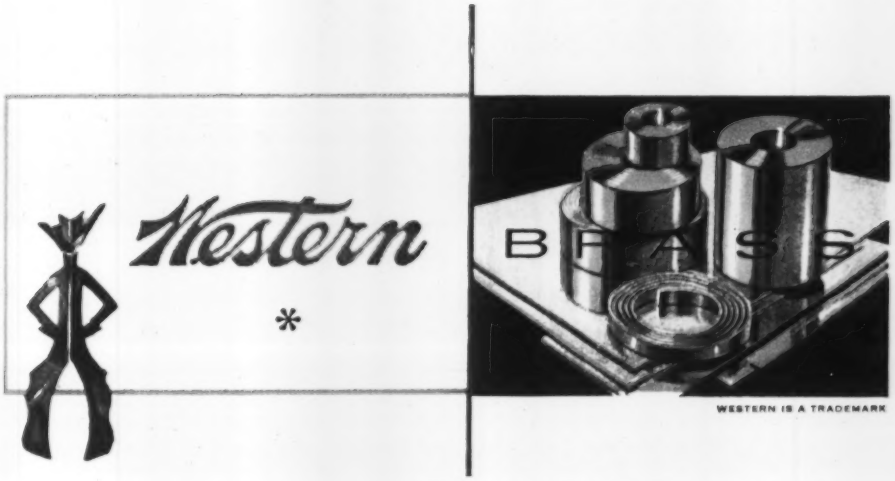
NEW PLANTS

Potter & Brumfield Div., American Machine & Foundry Co., Princeton, Ind., leased a 25,000 sq ft building in Marion, Ky., for the production of telephone type relays.

Hull-Thomson Ltd. has established a plant at Windsor, Ont., for fabrication of parts for the automotive industry. Operations will consist of roll forming, stamping, and welding. Officers are: President, R. W. Thomson; secretary-treasurer, Frank Hull.

Standard Refractories Ltd. has begun operations at Hamilton, Ont., with a complete range of refractory products, manufacturing facilities, and engineered installations. Principals are Fred Rutherford, John Storer-Folt, and Miss N. Kerry.

If you're interested in a *modern metal* you should research *brass*... especially Western Brass... it's "*tailor-made*" for each job!



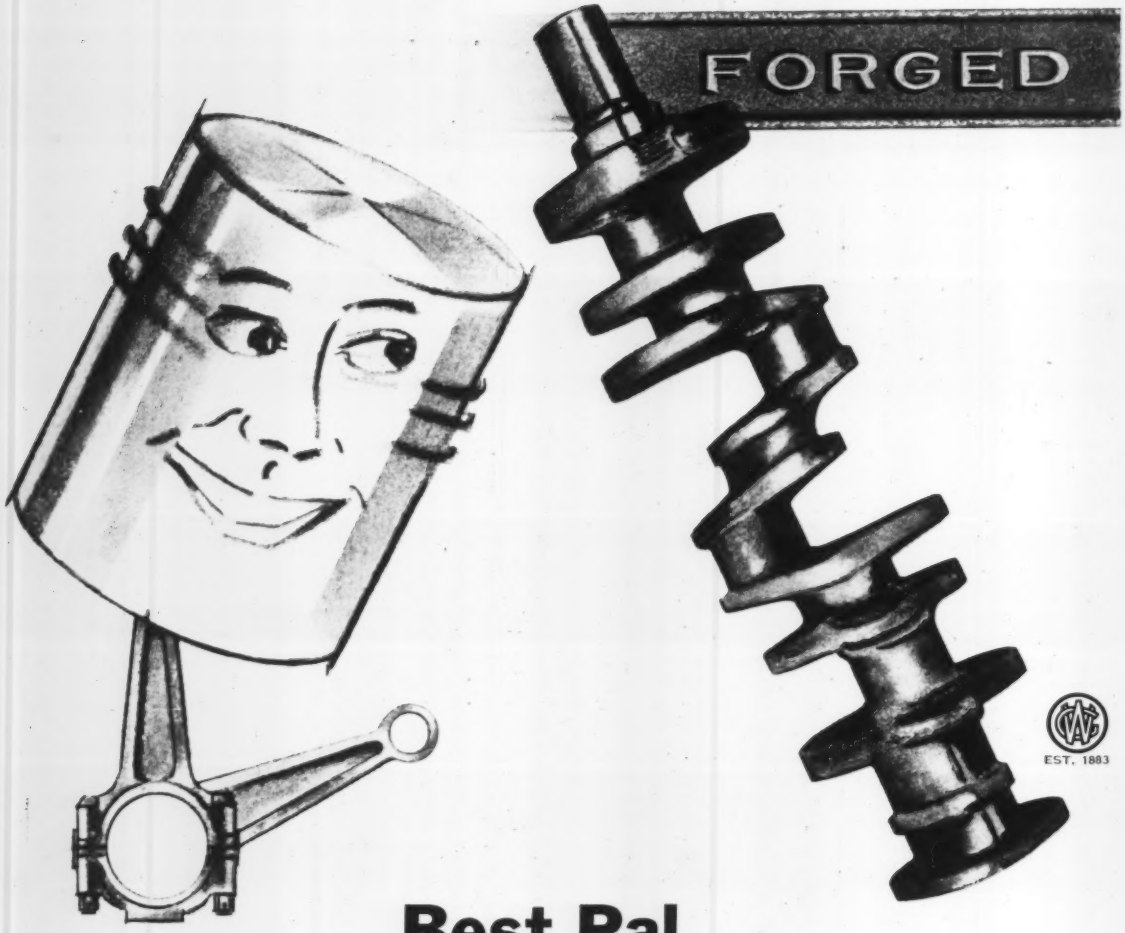
WESTERN IS A TRADEMARK

* Sheet and Strip Specialists in Brass and Copper *

The man from Western is only a phone call away

OLIN MATHIESON CHEMICAL CORPORATION
Western BRASS

MILLS: East Alton, Ill., New Haven, Conn. • SALES OFFICES: Boston • Chicago • Cincinnati • Cleveland • Dallas • Dayton • Decatur, Ga. • Detroit Grand Rapids • Indianapolis • Long Island City • Los Angeles • Milwaukee • New Haven • Philadelphia • Rochester • Rockford, Ill. • Saint Louis



Best Pal a Piston ever had

Crankshafts have been made successfully by other methods of fabrication and have proven good enough for certain non-critical applications—but for maximum dependability of the modern, compact, high-compression, high-torque, heavy-duty engine a forged crankshaft is essential.

In a crankshaft there is no substitute for a forging, and in a forging there is no substitute for Wyman-Gordon quality and experience.

WYMAN-GORDON

FORGING

Aluminum *Magnesium* *Steel* *Titanium* *Beryllium* *Molybdenum* *Columbium*

WORCESTER MASSACHUSETTS

HARVEY ILLINOIS
DETROIT MICHIGAN
GRAFTON MASSACHUSETTS
FORT WORTH TEXAS
FRANKLIN PARK ILLINOIS
LOS ANGELES CALIFORNIA

NEW FERROCHROME FOR STAINLESS— Low carbon chromium additions to stainless steel are said to be much simpler with a new material produced in a vacuum by Union Carbide Metals Co., a division of Union Carbide Corp., New York. Carbon contents are below 0.010 per cent, the firm states.

INTENSIFIED QUALITY CONTROL— Next year Chrysler cars will be made to tighter standards because of a quality control program which trains supervisors from all its assembly plants. Each one is spending two weeks on preproduction models in a separate Detroit plant (Clairpointe) learning exactly what the company wants during 1960.

NEW ZINC ALLOYS— Superior resistance to creep and grain growth and a lower coefficient of expansion than previous compositions are claimed for a new series of zinc alloys containing copper and titanium. New Jersey Zinc Co., New York, expects its development to replace many other nonferrous metals in structural and ornamental parts.

PRODUCTS TO GROW ON— If you're looking for something new to make, try Office of Technical Services, Department of Commerce, Washington 25, D. C. Hundreds of U. S. owned patents are available at no charge. Ask for Supplement 2, patent abstract series, which covers seven booklets on everything from instruments to ceramics. "It is a proved source for new ideas; many patents have been used 'as is.' Others have required a little work," says John C. Green, director of OTS.

CRISIS IN STANDARDS— The technology race with Russia is being jeopardized by our inability to provide industry with suitable standards for everything from millionths of an inch to high frequency vibrations, warn national technical leaders. Experts from the National Bureau of Standards and the Aerospace Industries Association recently met with press representatives to explain the emergency. Their suggestion: More basic research co-ordinated through the Bureau of Standards.

KEEP COLD WITH GOLD— Missile and aircraft sections other than nose cones are best protected from heat by thin gold platings, claims R. T. Hopper, vice president, Engelhard Industries Inc., Newark, N. J. Tests over a period of a year and a half show the metal has no equal.

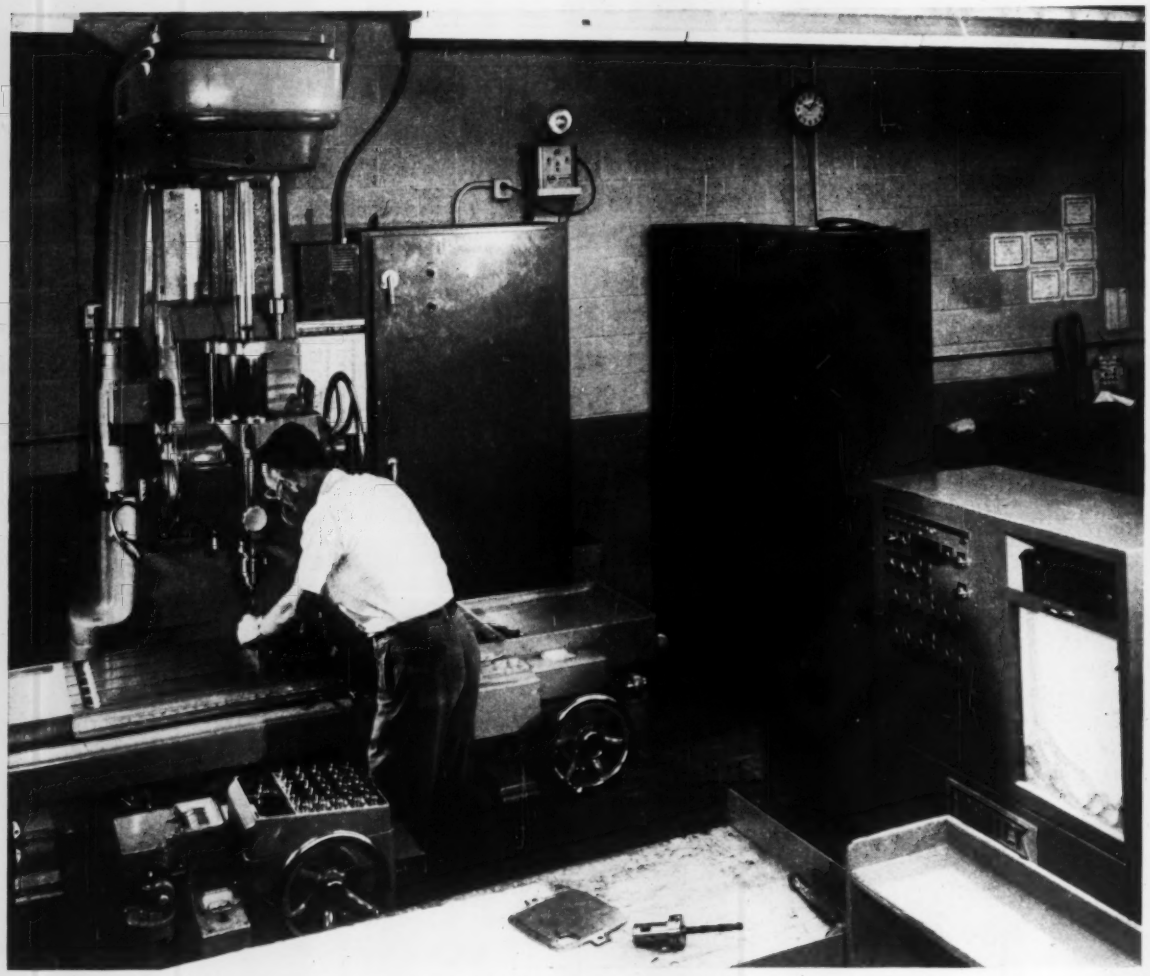
HARDER THAN ANODIZED— A new finish called Duranodic is harder than regular anodic coatings, says Aluminum Co. of America, Pittsburgh. Finishes run from bronze-silver to bronze-black and work well on 6063 alloy extrusions. The process is nonexclusive, royalty free.

SOUND CHECKS METAL BARRIERS— High intensity sound (150 decibels) is being used to check small assemblies for resistance to noise fatigue. One speaker manufacturer, Stromberg-Carlson Div. of General Dynamics Corp., Rochester, N. Y., indicates that the method may also be a means of controlling the operation of solid fueled missiles.

MORE ALUMINUM FOR WELDING— Increasing use of aluminum for welding structures in missiles, trucks, and tanks is bringing a flood of new alloys. Among them is an aluminum-magnesium type called 5456. Its tensile strength is said to be 51,000 psi.

FORD HAS 500,000 PSI STEEL— Hot cold working a modified SAE 4340 steel in the 800 to 1050°F transformation range produces tensile strengths approaching 500,000 psi while retaining adequate ductility. (An article describing the Ford Motor Co. breakthrough will appear in STEEL Sept. 21.)

Tape Puts Jig Borers on Production Line



At GE, this numerically controlled jig borer turns out a wide variety of jet engine parts. The machine cycle is controlled by the tape reader at far right

By E. F. MYERHOLTZ
Production Engine Dept.
and
J. W. BERGMAN
Flight Propulsion Laboratory Dept.
Flight Propulsion Div.
General Electric Co.
Cincinnati

NUMERICALLY controlled jig borers are ready for practical and economical production and development work. At our plant, two of the machines are turning out a wide variety of parts, usually in lots of less than a dozen, at a fraction of the cost we would incur in conventional machining.

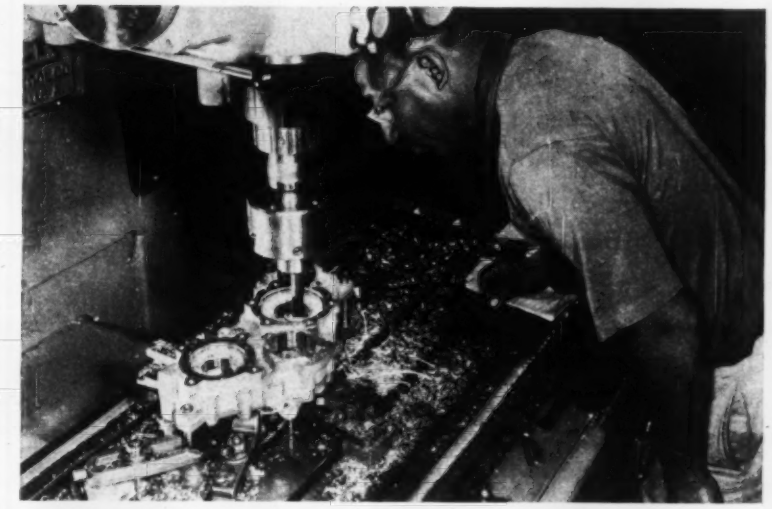
Added to the economy is the advantage we realize in part quality. The tape is the operator's best insurance against rejects. Some of our materials cost as much as $60 a pound.

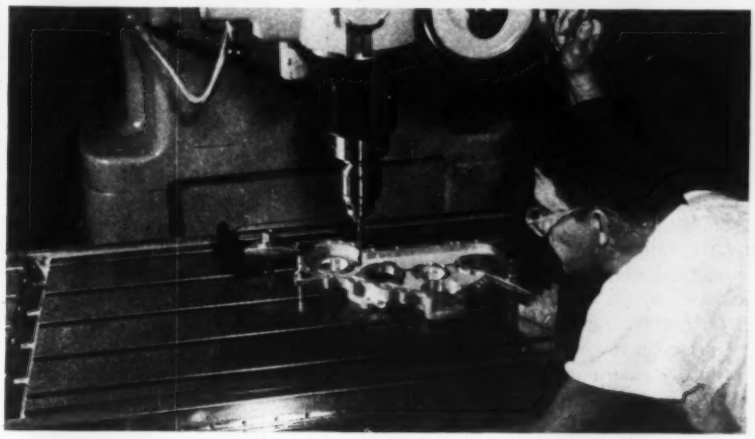
• The main production requirement was for efficiency in low volume runs.

Unlike the J47 jet engine that we mass produced during the Korean conflict, none of the recent series of engines has been required in sufficient volume to justify purchase of single purpose machines to finish close tolerance parts like the gearboxes.

The present J79 engine is popular enough to move it into the production class, but still it won't justify special machines. Each airframe that uses the J79 is a little different, so some variation is needed in the engine and the gearbox configuration. There are at least nine different versions of the J79, and none represents large volume production.

Removed from their traditional role as toolmakers, the machines are paying off in short lot production. Tape control has boosted efficiency and part quality





This pair of numerically controlled jig borers, one in production (above) and the other in the laboratory (below) are used interchangeably. In these photos the machines are working on two different types of jet engine gearboxes

• Our first numerically controlled jig borer was installed in the Production Engine Dept. in June, 1957.

We had heard about a machine being built by Fosdick Machine Tool Co., Cincinnati, for a computer manufacturer. This punch-card-controlled machine was repeatedly holding tolerances of ± 0.0001 in. on location and +0.0005, −0.0000 in. on diameter. Further, it was tailored to small lots.

Our Fosdick was used to bore and drill precise holes in J79 gearboxes. We use the eight-channel Flexowriter tape to control the machine. Tapes are prepared directly from blueprints, and the operator is furnished with directions for setting up the part on the machine table.

From that point on, the operator's job is to change tools and control depth. The tape does the rest of the work, including changing speeds and feeds to suit the tools. The operator can lock out the tape control and operate manually.

It takes no more than 4 hours for an experienced planning engineer to set up the tape from a typical blueprint. Hole locations are determined on ordinary blueprints by polar co-ordinates from one key point (the bolt circle drafting method), but the tape must be programed in rectangular co-ordinates because the table motions it directs are longitudinal and tranverse only. This translation time is one area where numerical control could be improved. It may mean that new drafting methods should be used.

• The first numerically controlled jib borer at GE demonstrated that programing makes the machine a true production tool.

This has been hard for some people to accept. They want to reserve the jig borer for its traditional toolroom role. We feel the surest way to get it to pay for itself is to keep it busy with production runs. Now that the machine has proved its worth, it's kept going two shifts a day.

Setting up for a production run takes only a few minutes. The operator installs the tape in the reader and sets up a temporary fixture of locating pins. From then on, production is a routine of clamping the part, pushing the start button, and changing tools as the machine completes each hole sequence.

• Success of the first machine set up the purchase of another for the laboratory.

The Flight Propulsion Laboratory is a development and special job shop for the whole plant. It rarely has production runs of as many as a dozen parts. Eying the success with which the tape controlled jig borer bailed the production department out of short lot trouble, laboratory personnel got a machine of their own.

Since chances for human error can be discounted, the accurate manufacture of text specimens is simplified. Tapes can be stored and rerun at any time, with the assurance that a part made next month will be exactly like one made today.

With the availability of both machines, production and laboratory men use them interchangeably to preclude delays in either department.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service STEEL, *Penton Bldg., Cleveland 13, Ohio.*

Drives Get Smaller, Carry Bigger Loads

● Improved manufacturing precision and control are getting the bulk out of gear drives. Cooling of worm gear units is helping too. V-belts are smaller due to use of stronger materials.

● American Gear Manufacturers Association says new classification system will be ready in about six months.

USERS of mechanical drives should be watching these developments: The trend toward size reduction (for better space utilization), the increased popularity of shaft mounted reducers, and forthcoming changes in standards by the American Gear Manufacturers Association (AGMA).

• **Smaller but Better**—Functional design in driven equipment is increasing demands for higher horsepower through smaller mechanical drive units. The trend is boosted by better control and higher precision in manufacturing processes. Manufacturers are using alloy steels, higher hardness gearing, and grinding after heat treatment.

Higher quality gears (close tolerance) perform better. Face widths and outside diameters can be reduced when tooth spacing, runout, and bore tolerances are tightened.

As a rule, high precision gears have increased load carrying capacity. For the same load, a high precision gear can be made smaller than an average commercial gear. Smaller, precision gearing represents a saving of material, initial running in time, testing, and maintenance.

• **Fins and Fans**—In June, AGMA adopted a formula that permits more power through smaller worm gear units. Finned body castings cooled by fans are used to permit the greater rating and capacity.

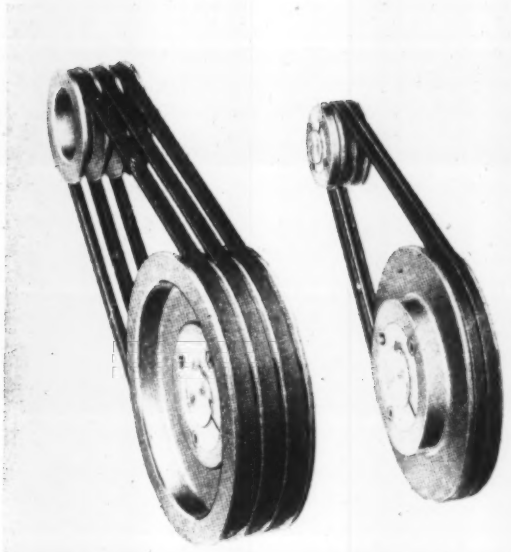
Some makers have finned and fanned models on the market, and others will be making announcements soon. Load capacity of one new model is as much as 80 per cent greater than that of comparable, nonventilated models.

Size reductions are also coming about in other types of gear drives.

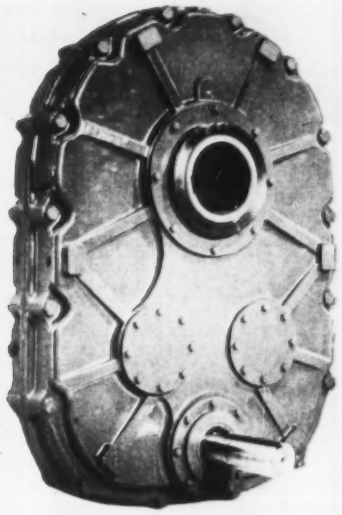
V-belts are becoming smaller too. This trend is coming from improved cord construction, new synthetic cords, and improvements in compounding. A 40 per cent increase in ratings of standard models has been announced by one manufacturer.

• **More Consumer Acceptance** — Shaft mounted speed reducers are gaining rapidly, several manufacturers told STEEL. The advantages of the unit include versatility, easy installation and adjustment, low first cost, and compactness.

Cost conscious operators are especially impressed because no foundation is necessary, and V-belt or roller chain drives can be adjusted readily with the supporting arm attachment (rod or torque



Smaller, stronger V-belts: Fewer belts, narrower sheaves, and smaller center distances are the trends



Shaft mounted reducers are popular. One maker introduced about 45 new models in the last few years.

arm). Different sets of sheaves and V-belts also permit more speed variations.

Some shaft mounted units are available without a torque arm. They're fastened to a supporting area on the driven shaft. Modifications of the shaft mounted principle include flange mounted reducers.

• **New Classification System** — AGMA analyzed German and Japanese gear classification systems and found they're not adaptable to our gearmaking processes. John C. Sears, executive director, AGMA, says our new system will be ready in about six months.

Old standards couldn't do the job. For example, users could order coarse pitch gears on the fine pitch standard. Things like bidding and cost estimating will be made easier by the new standards.

AGMA says the new system will have 15 or 16 classes with Class No. 3 as the crudest and Class No. 14 at the finest. Each class will contain a number of variables. For example, it will probably be possible to specify a Class No. 8 tolerance runout and a Class No. 9 tolerance on pitch variation. Inspection standards will also be tied in. They will detail the best methods of checking specified tolerances.

• **Strength, Durability Standards** —New and revised versions of the spur, helical, herringbone, straight bevel, and spiral bevel gear strength standards will be ready for publication by the end of the year, says AGMA. Work on the strength formulas is largely completed and will come out first.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Time to Modernize?

Updating mechanical power transmission units can help performance and cut repairs and maintenance.

An obsolete or faulty drive can cause production to slump and make repair frequency climb. More horsepower and better power transmission can put a line of modified machines on par with new models.

Power and transmission equipment help make the big difference between a high capacity machine and an old, low capacity unit.

Take a second look. Some of the available units might give you the capacity and performance of a new machine at a more modest cost. Some can also give you the advantages of reduced size and higher capacity.

Six Parts of a $13,017 Annual Saving

PARTS	Cost of Material (Per unit) Bar Stock	Powdered Metal	SAVING
Spring Retainer	0.116c	0.0357c	$1,606
Spring Retainer	0.08	0.0377	866
Spring Retainer	0.102	0.029	1,460
Pinion	0.23	0.023	4,140
Clutch Gear	0.28	0.188	1,840
Worm Wheel	0.245	0.09	3,105

How We Beat the Cost Crisis

Material Switch Trims Parts Costs

A change to powder metal cropped costs 62 per cent. The article is an entry in the Cost Crisis Awards Competition

CONTROLLING the quality and over-all cost of complex printing presses requires a close watch of the cost and quality of thousands of parts of different sizes, shapes, and materials. So says Arthur H. Miller, advance planning engineer, Goss Div., Miehle-Goss-Dexter Inc., Cicero, Ill.

To illustrate, Mr. Miller cites six small pieces made from two types of steel bar stock on which costs were trimmed about 62 per cent. A worm wheel, gear, and pinion all were made from SAE C-1020 steel, and three spring retainers were made from AISI B-1113 steel.

• **Scrutiny of the six parts was part of regular advanced planning department programing.**

"Why," a Goss engineer asked, "couldn't these parts be made more cheaply as powdered metal parts?" To find the answer, Goss solicited information from every major powdered metal parts fabricator in the country. From information returned, Goss selected five suppliers and sent specifications for each of the six parts.

Simultaneously, the parts also were checked with five other companies to see if their methods of manufacture could compete.

Analysis of the quotations showed that the parts could be made from powdered metal and meet all specifications, and that the parts could be produced at a lower cost than any other investigated method would allow.

• **Cost cutting was achieved in the price of the purchased materials, and also in the cost of processing parts.**

The six parts were formerly purchased in quantities of 20,000 a year, at a total cost of $21,200.

Now, purchased in the same quantities, the total cost has plummeted to only $8183 a year.

Brazing, Soldering Time Cut by Induction Heaters

The high frequency induction heaters of a new automatic brazing and soldering facility have cut brazing and soldering time 90 per cent in production of Sparrow III missile components.

In making gyroscopes and accelerometers, time requirements are 18 seconds vs. 3 minutes by older methods. The rejection problem has been practically eliminated, says L. C. Porter, applications engineer, Raytheon Co., Waltham, Mass.

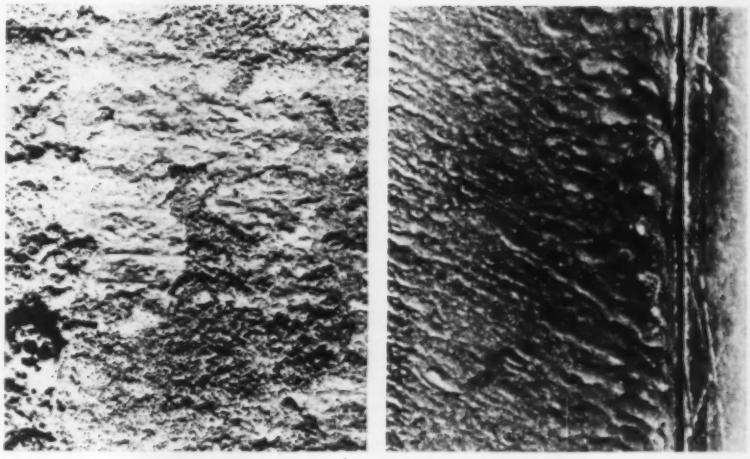
The brazing and soldering equipment, made by Raytheon, can be used for most jobs requiring a controlled atmosphere. Production tolerances can be held, and temperatures can be closely controlled at any point in a 90 to 3000° F range.

Silver brazing, lead-tin alloy soldering, shrink fitting, hardening, tempering, and local stress removal can be handled in a controlled atmosphere. Brazing can be done in a hydrogen atmosphere with a nitrogen purge after each operation.

• **High Frequency Heater** — The heater has a variable impedance output that can be matched to the load, rather than requiring that the load be matched to the heater's fixed impedance. Heaters are made by General Electric Co.

Practical advantages: In designing the heating coils used in the fixtures, it is no longer necessary to compromise between a coil which gives the desired heat pattern and one which matches the induction heater, says GE. Instead, the coil is designed for optimum heat pattern, and the impedance of the heater is quickly matched to the load by a dial control. Result: Valuable design time is saved and interchangeable fixture components can be used. That, in turn, reduces the number of units and provides system flexibility.

All fixtures are plug-in types specially designed for the facility. Hose connections (for the water cooling system) are of the make and break type. A rheostat provides power control. Once two buttons have been pressed simultaneously, all steps are automatically controlled at preset intervals by a timer (a part of the GE control panel on each table).



Heliarc torch cuts smooth edge shown at right. It is compared with a powder cut in 2 in. stainless. It can be welded without further preparation

Heliarc Offers Better Way To Cut Stainless Steels

Argon-hydrogen gas mixture protects cut edges from oxidation, tests show. Versatility enables warehouse to supply more complex shapes, paring machining costs

A NEW cutting method is increasing sales of stainless steel at Morrison Steel Co., New Brunswick, N. J.

The process is Heliarc constricted-arc cutting, the forerunner of plasma arcs. The maker, Linde Co., a division of Union Carbide Corp., New York, touts the method for stainless cutting by citing these advantages: 1. Users find a minimum of carbide precipitation along cut edges. 2. Machinability and magnetic properties are unchanged. 3. Cuts can be made to tight tolerances without distortion or discoloration.

• **The cutting device is a definite advantage in warehousing, says John D. Walt, plant manager.**

Morrison Steel finds the cutting tool makes it possible to use stainless drop-ends from other cutting operations which formerly were waste material. It has also expanded its inventory of plate sizes to include those which couldn't be handled by previous cutting equipment. In addition, the new tool can cut shapes earlier considered too complex.

Stainless plates cut by the Heliarc torch can be welded immediately without further edge preparation.

W. B. Coleman & Co., consulting metallurgists, Philadelphia, checked the cut edges on some Type 304 stainless for Morrison. Its report: "No harmful effects."

Stainless can be cut by other methods but not as easily, says Linde. Straight lines can be handled by shearing, abrasive sawing, or powder cutting. Irregular shape cutting calls for bandsaw work or the powder method which has the drawback of requiring machining and annealing of the cut edges.

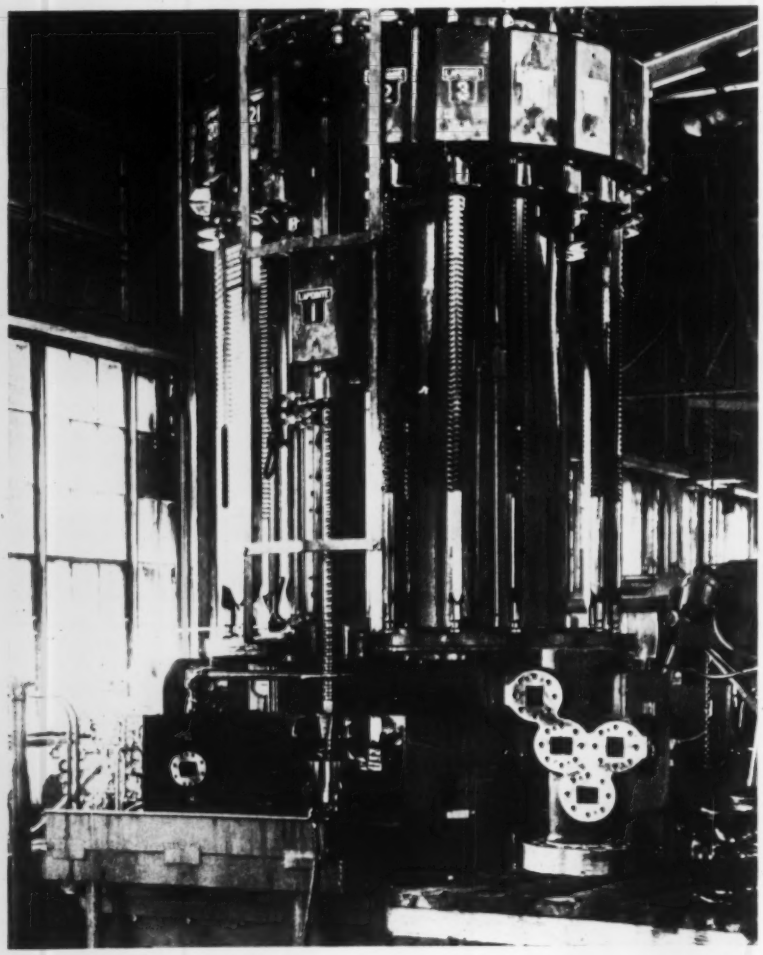
Parts are cut by Morrison include gear blanks, flanges, baffles, discs, and decorative pieces used primarily in equipment which must withstand corrosion.

39 Valves Broached in Time It Used to Take for One

Cycle time for six holes on one part has been cropped 97 per cent. A dead center pull on the tools is credited with the fine finish generated

ENGINEERS at Lapointe Machine Tool Co., Hudson, Mass., are working to broaden the horizon for broaching, often departing from convention to attain their goal.

One job they tackled and solved was the internal broaching of helicopter blades up to 44 ft long (STEEL, Aug 17, p. 104). This time it's a vertical broaching machine with an unusual 21-tool turret for machining oil field gate valves.



Riding the vertical turret, 21 broaches can be used (in any sequence) to machine gate valves like the one at right. Broaches also can be indexed in their holders to cut the proper shape in the part

• **Success**—The machine, installed at Cameron Iron Works, Houston, has made drastic reductions in the time taken to broach openings in the valves. As an example, it takes 90 minutes to broach six holes ($2\frac{3}{8}$ x $4\frac{1}{4}$ by 10 in. long) in one model valve. Allowing another 30 minutes for handling, the total time to broach the part is 2 hours.

Result: Cameron production men can machine 39 complete valves in the time it used to take to machine one (13 hours per hole, 78 hours for the whole part, were required under the old method).

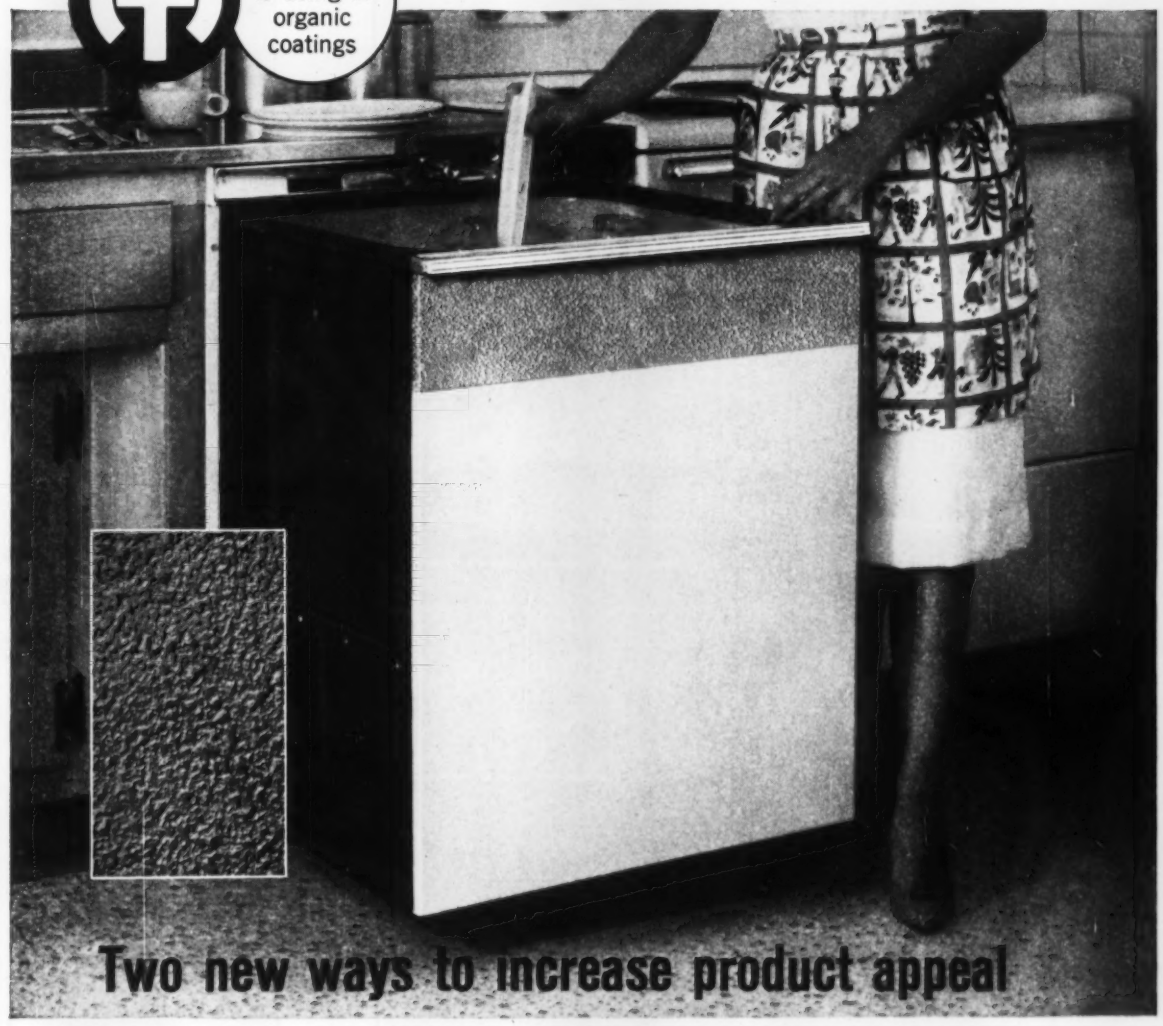
• **How It Works**—The machine has a 60 ton normal pull, an intermittent peak pull of 85 tons, and a stroke length of 78 in. The turret has 21 stations for storing the 80 in. long broaches.

The operator presets the machine cycle to produce the required hole size. For some sizes, a single tool does the job. On other sizes, a broach sequence using as many as 14 tools may be necessary. With this predetermined cycle established, the operator pushes the start button, and the machine cycles automatically, bringing the proper tools into position, pulling them through the part at speeds up to 25 ft a minute, and then returning the tools to their position in the turret.

One feature which the Lapointe engineers feel has helped the machine pay off is a so-called dead center pull. It's designed to eliminate all stresses and strains that crop up when pulling a large broach off center. The broach in this machine is pulled dead in line with the cylinder by the pull head attached to the end of the piston rod. The broach is securely held at the top and bottom during the entire working stroke. It is guided through the cut on hardened and ground ways. Broached surfaces can be as fine as 25 microinches.

The sequence of operations can be changed easily, setting up a new automatic cycle. The operator also can select a single station to be used for continuous operations. Broach change time is only 5 minutes.

What M&T is doing in organic coatings



Two new ways to increase product appeal with richly textured M&T vinyl finishes

Adding the richness of a textured or patterned finish is a fast way to create a "deluxe" line without spending much extra money . . . if any. Two recent developments in M&T vinyl coatings make such appealing finishes particularly easy to adopt.

1. M&T Coating 6400 sprayed on smooth metal products gives a handsomely textured finish, with a warm, leather-like appearance.

2. M&T Coating 6440 sprayed on products fabricated from mill-patterned sheet metal faithfully mirrors even the most delicate metal pattern in thick as well as thin coatings.

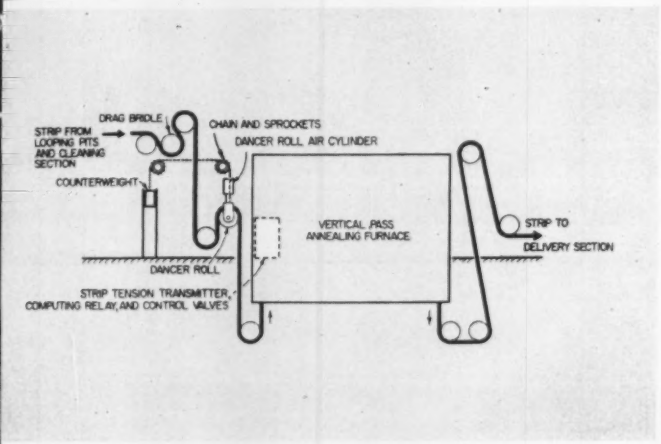
Advantages? There are plenty. Sprayed vinyl coatings prove at least 10 times more wear resistant than baked textured enamel. And their inherent chemical resistance protects against stains and corrosion. Then there's the warmth to the eye and touch . . . the sound deadening qualities . . . the color possibilities. As for production, spraying the finished product eliminates expensive scrap loss; it also eliminates seam problems at all joints.

Ask the M&T Man about them . . . and about other quality M&T products to help you add more value to *your* products

METAL & THERMIT
CORPORATION
GENERAL OFFICES: RAHWAY, NEW JERSEY

Strip Tension Control Reduces Breakage

Annealing line tension is set from a remote point; it's maintained by a recorder-controller system and a floating roll mounted on a pneumatic cylinder. Positioners on air control valves respond quickly to tension changes. Line performance is charted for later study



AN INCREASE in tension on strip processing lines can often boost output and improve product quality, but you need precise control to prevent sudden overloads and reduce breakage.

Strip tension is controlled automatically on continuous annealing lines at the Vandergrift (Pa.) Works, United States Steel Corp. The pneumatic control system was developed by Bailey Meter Co., Cleveland.

• U. S. Steel's engineers were looking for a way to adjust tension quickly, to compensate for changes in strip speed, temperature, or size.

The three annealing lines at the plant were designed to finish high quality silicon steel. They have a rated speed of 465 ft per minute, and normally process strip 0.014 to 0.031 in. thick, at 150 to 250 ft per minute.

Engineers insisted on more than the customary strip tension to meet product quality standards without holding back production.

• One solution: A pneumatic control system, made of standard components.

Application engineers from Bailey Meter suggested regulating tension with a floating, or "dancer," roll supported by an air cylinder and actuated by a recorder-controller system.

Tension is selected on the manual loader, or tension set point. A tension transmitter sends signals to a tension recorder, and to the computing relay, which actuates air control valves to increase or decrease tension.

• The system reduces danger of strip breakage. It offers several other benefits.

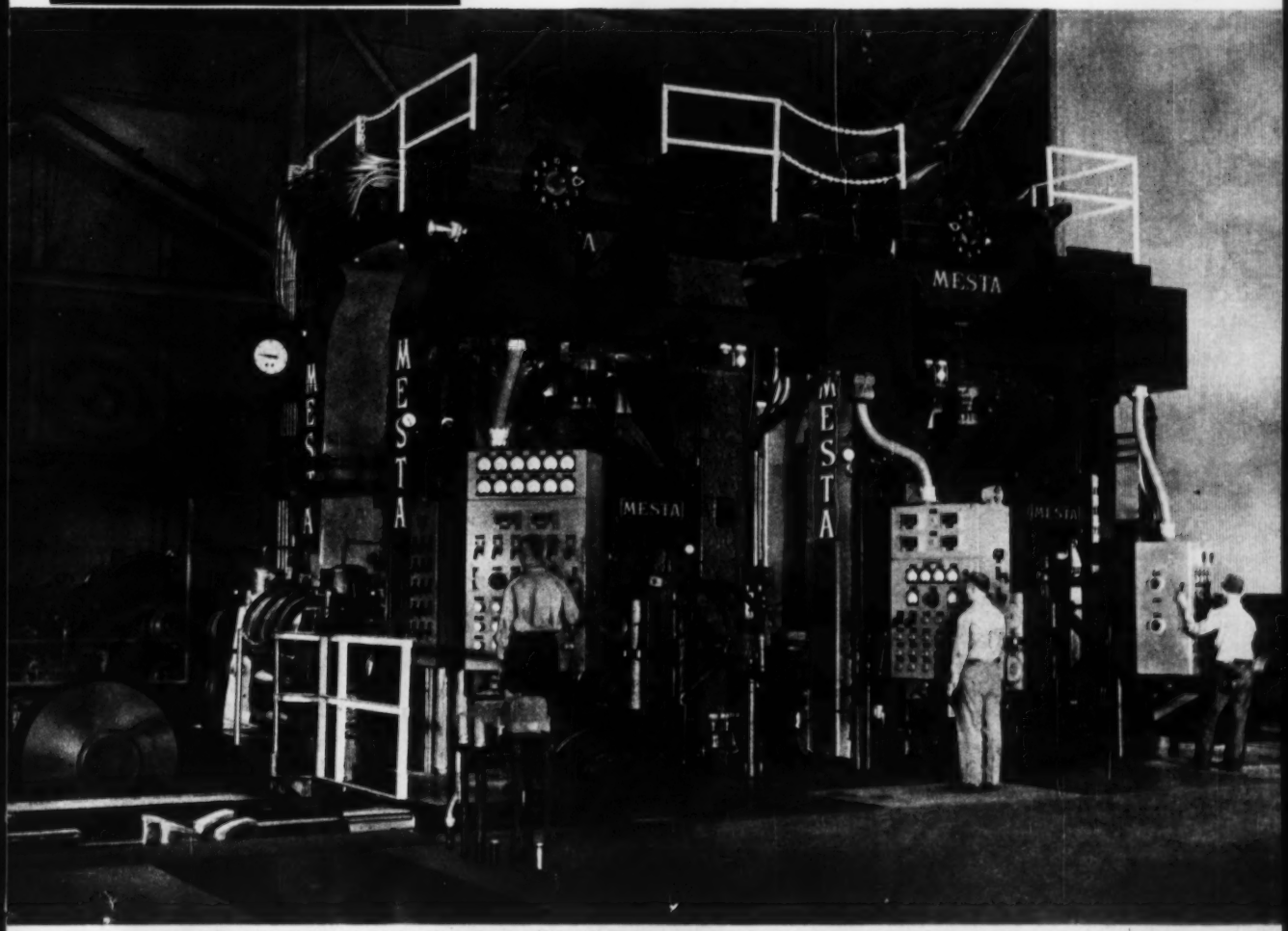
The annealing line operator can make tension settings quickly. And there's little chance of error; the single set point adjustment is calibrated in units of strip tension. Formerly, operators had to balance individual air control valves at the entry end of the line.

The pneumatic system is simple and reliable. Positioners on the air control valves insure rapid response of the dancer roll to tension changes. The roll rides out small, sudden strip strains.

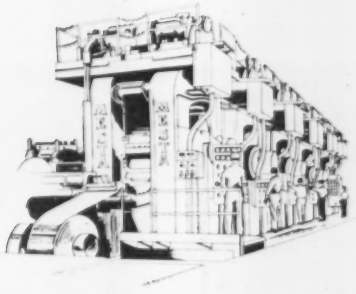
The tension recorder provides a 24 hour chart of line performance.

Capital and operating costs are modest. Prevention of a single strip breakage in the furnace would justify installation of the equipment.

MESTA COLD MILLS



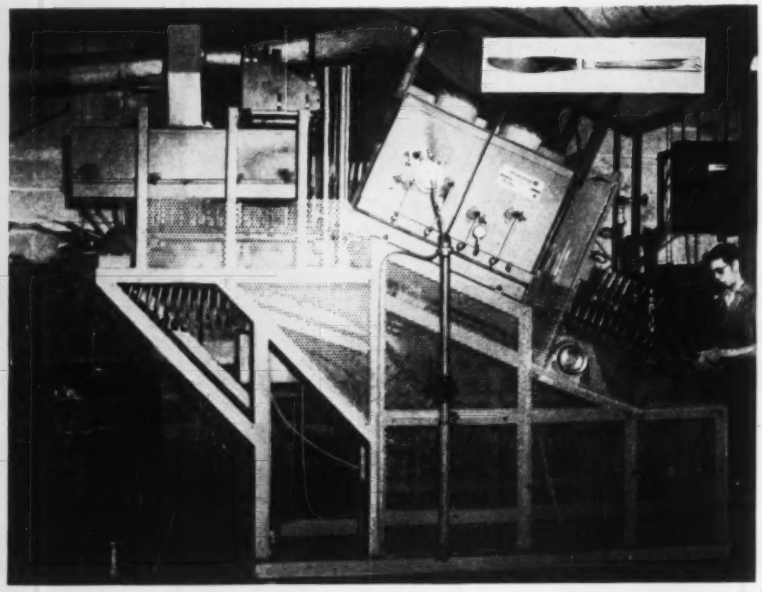
MESTA 51" Two-Stand Tandem Temper Mill Operating at the Yorkville Works of Wheeling Steel Corporation.



Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA



Automatic Heat Treatment Hardens Stainless Knives

Gas fired conveyor unit at Oneida Ltd. turns out 1500 uniform blades per hour with one operator. Compact mechanism saves fuel, simplifies process, has repaid original investment several times

A COMPACT automatic heat treating machine has replaced lead pots for the hardening of Type 410 stainless steel knife blade (inset) at Oneida Ltd., Oneida, N. Y. This producer of fine tableware has found the change saves in processing steps, ups production, gives the desired hardness pattern and uniformity, and saves $700 per year on fuel costs alone. Only one operator is required.

• Walter E. Moulton, Oneida's chief metallurgist, reports that the initial cost of the installation already has been repaid several times over, while safety and plant housekeeping have been improved.

Originally, knives were racked in a jig, preheated in a gas fired lead pot to 1500° F, transferred to a similar furnace at 1900° F, then oil quenched. After hardening, the blades were tumbled in sawdust to remove oil. Lead removal required a second tumbling step. Warpage in heat treatment made a manual straightening operation mandatory.

• The new process, designed by Selas Corp. of America, Dresher, Pa., is mechanized yet each blade is treated individually.

A single operator inserts each knife, handle down, into a fixture so that only the blades are exposed. Fixtures are adjustable for blade lengths of 3 to 5⅞ in., by changing their height on the continuously moving conveyor chain.

As the knives move up and away from the operator, they pass through a narrow slot into a heating chamber only 3 ft long, where the blades reach a temperature of 2000° F in 45 seconds. The high speed heating results in scalefree blades.

The high heat head necessary to obtain such rapid heating is obtained by special radiant burners on both walls of the narrow heating chamber, firing opposed as the blades pass between them. Although the blades pass close to the burners, there is no chance of flame impingement on the work. A combustion controller provides accurately controlled gas-air ratios as desired, regardless of variations in fuel demand, to the various burners. Here the controlled mixture is burned against the cup-shaped refractory surface, and combustion is completed inside the burner cup. The refractory, in turn, radiates the heat to the blades passing through.

• Quenching is also automatic. As the knives leave the furnace, they are hit by a continuous air blast in a cooling zone. Their temperature drops to about 350° F in less than 3 seconds—fast enough to eliminate the need for a quenching oil, so there is none to clean off.

Passing out of the cooling tunnel to return to the loading station, the chain inverts the holding fixture and the knives drop out into a tempering basket at floor level. The basket is moved to the tempering area, and the knives are left to return to room temperature before being tempered at 450° F.

Blades are highly uniform, with a hardness of Rc 42-44, while the handles remain at Rb 85-95. Production is 1500 knives per hour, in a floor area 9 by 3½ ft.

After tempering, the work goes to another department for tumbling, grinding, cold coining, and final finishing.

Use of the carrier mechanism makes handling uniform as well as largely automatic. Little operator training is required. Heating is standardized by close control of predetermined fuel-air ratios, ease of burner adjustments (they have a flexible mounting to follow wall expansion) and constant firing rate of the burners. Temperature is controlled in the heating zone by an indicating controller driving a full modulating motorized fuel-air control valve.

The arrangement of fixtures permits the chain to run below the level of the burners, easing problems of lubrication and wear.

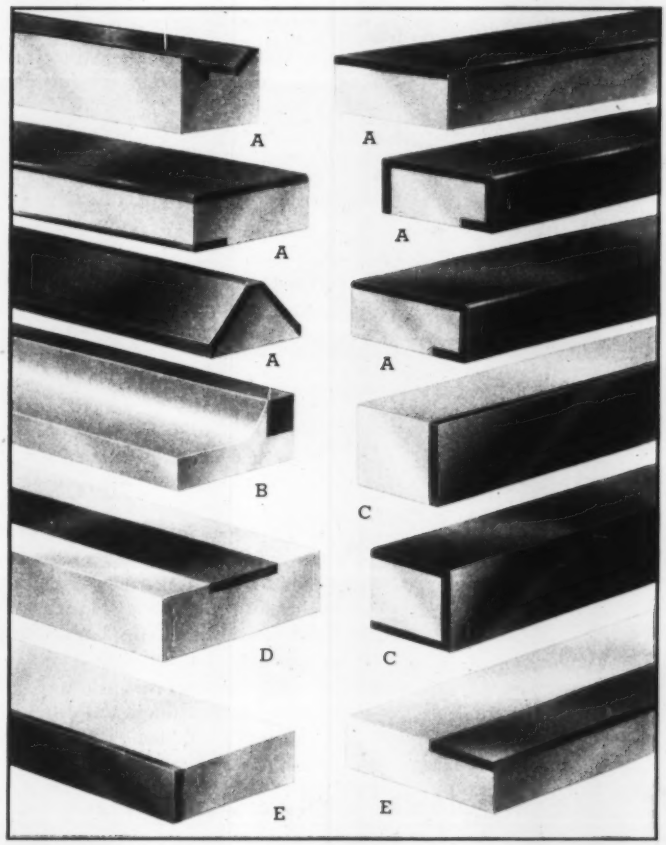
O-KNI-CO MACHINE TOOL news

PRODUCTION FACTS THAT INCREASE YOUR PROFITS

PUBLISHED BY THE OHIO KNIFE CO., CINCINNATI, OHIO

NEW READY MADE STANDARD HARDENED SHAPES SAVING MONEY FOR HUNDREDS OF COMPANIES

USED FOR DIES, DIE SECTIONS, FLANGE SECTIONS, WAYS, GIBS, RAILS, WEAR PLATES. CARRIED IN STOCK BY OHIO KNIFE CO., CINTI., OHIO.



A—Hardened Ways and Slides **B**—Composite Die Sections

C—Heel Block **D**—Center Clad **E**—Flange Slide

Over 12 standard cross sections in over 80 sizes now available.

The multiple use of these sections by machine tool builders, die makers, etc., has increased tremendously. Great savings are achieved by being able to order from stock and in lengths up to 120". They are delivered to the customer with cutting, forming or wear surface already machined, hardened and ground. The soft steel backing, to which specially hardened tool steel is clad, can be drilled quickly for dowel and screw holes. The special O-Kni-Co hardening process (65-66) Rockwell to the full depth of tool steel along the entire length of the section develops tremendous wear resistance. They are precision made to the closest tolerances. Also available are clad aluminum bronze wear plates (¼" thick aluminum bronze clad to a tough, easily machinable steel base.)

FREE technical literature available. Check off—mail coupon today.

THE OHIO KNIFE CO., Dept. 100-AF
Cincinnati 23, Ohio

Gentlemen: Please send me free copy of:

☐ BULLETIN-A describing 12 standard cross sections in over 80 sizes

NAME_____

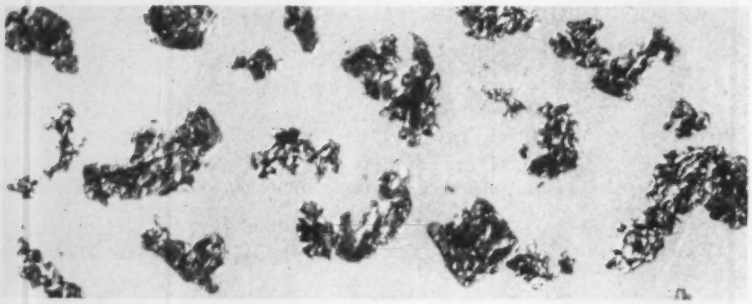
COMPANY_____

ADDRESS_____

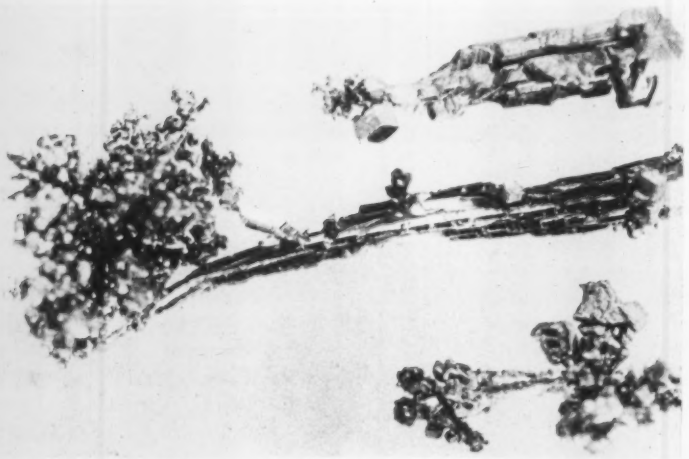
CITY_____ STATE_____

Electrolytic Method Promises Cheaper, Purer Titanium

Developer says it's easier to reduce the ore with carbon and separate the pure metal in a molten salt. Benefits await adoption of a production program



Small dendrites are 99.6 per cent pure titanium made in one step directly from the carbide. (Brinell hardness is 157.) Second refining process produces the large crystals which are 99.8 per cent pure (Brinell hardness 110)



THE TITANIUM you buy tomorrow may be cheaper if production plans for an electrolytic process developed by Norton Co., Worcester, Mass., was realized.

It features titanium carbide, easily produced from ore, and molten salt. An electric current produces the titanium as crystals which are almost as pure as Ivory soap.

Other possibilities: The process will refine other refractory metals like zirconium and hafnium.

• Titanium carbide mixed with pitch is baked into a porous lining for the crucible.

The key to the process is that titanium carbide behaves during electrolysis like a metal with a high carbon content, says Norton. The method differs from the Kroll process in that it uses the carbide rather than titanium tetrachloride and magnesium, said to be fairly complex chemically.

One of the cheapest ways to get a metal from its oxide is to reduce it with carbon. However, reduction of titanium ore doesn't produce metal —it produces the carbide for the electrolysis method. Norton feels titanium made this way has great commercial potential.

The nickel or steel cells used to hold the molten salts (sodium-potassium chlorides and fluorides) are first lined with graphite then covered with a layer of carbon-bonded titanium carbide. Carbon bonding of the anode (crucible lining) is done by sintering at 4170° F, or by mixing the carbide with pitch, molding, and baking at 1800 to 2200° F in an inert atmosphere. Such linings are strong, porous, and are good electrical conductors.

A metal cathode is suspended in the center. The atmosphere is argon. All moisture must be removed.

• Users may choose either one or two steps to obtain varying degrees of purity.

The first step produces rather small crystals of pure titanium (called dendrites) which are about 99.6 per cent pure with a brinell hardness of 157. They can be used as is or put through a second refining to increase purity to 99.8 per cent, although that cuts the hardness number to 110.

One expert told STEEL he was surprised such hardness had been obtained. In his opinion, it's easier to make strong alloys if you start with titanium which contains some impurities, especially oxygen.

Several firms and the government have been interested in the electrolytic method for some time. Besides Norton, they include the Bureau of Mines, Horizons Inc., Cleveland, and E. I. du Pont de Nemours & Co. Inc.

The Bureau of Mines has also announced an improved cell for electrolytic refinement. An internally heated design, it is said to offer several advantages over externally heated types. Such cells can be used to refine offgrade sponge and scrap. In small scale tests, says the bureau, the cells operate more efficiently than older types and are simpler to construct.

Electrohydraulic Tracer Pares Production Time

Production time on Bomarc missile parts is being cut dramatically with the help of a 360 degree, automatic, electrohydraulic tracer.

The tracer is part of a new 425,000 lb roll forming machine that has reduced time on some jobs from days to minutes. The unit (developed by Hufford Machine Works Inc., El Segundo, Calif.) is in use at Marquardt Aircraft Co., Van Nuys, Calif.

The machine can handle 1 in. thick stainless steel blanks up to 5 ft in diameter. Maximum length for cylindrical workpieces is 5 ft. It can automatically spin conical, tubular, and parabolic shapes, with thin, heavy, or tapered sectional thicknesses.

• **Operation** — The piece (flat or cylindrical) is put on a rotating table which supports a mandrel. The operator then pushes a button on the console to bring the tracing stylus into position on a template.

The part is produced at a rate up to 6 in. per minute within 0.003 in. of specifications.

Heart of the system is an electronic apparatus that enables it to interpret signals from the electromagnetic stylus head to continuously adjust roller speed and angle. The maker: Machine Control Div., Minneapolis - Honeywell Regulator Co., Minneapolis.

The control center's signals convert template variations to electrical impulses which actuate hydraulic servo valves. The valves control a variable displacement pump to provide a different amount of fluid to hydraulically position and operate the forming rollers according to template variations.

Tracing feed rate is adjustable during forming and may be preset to provide either a constant feed per revolution or a constant rate regardless of spindle speed (up to 40 ips).

The rotating table is controlled automatically to yield constant surface speed for the forming tool even though the circumference of the rotating parts varies constantly. Spindle speed is variable from 10 to 400 rpm.

Automatic Die Lubrication Improves Forging Quality

Nozzle sprays colloidal graphite on the die after every press strike, reducing rejects and rework; dies last longer than with hand lubrication every ten strikes

INCREASING the frequency of routine service operations can make machines, dies, or other equipment last longer. But how can those services be performed often enough for proper maintenance, without exceeding limits of human speed and endurance?

The answer: Let automatic equipment do the job for you wherever possible.

Forging dies last longer, and quality of parts is improved at Bohn Aluminum & Brass Co., Detroit, thanks to an automatic die lubricator. The equipment was supplied by Columbus Automatic Lubrication Co., Columbus, Ohio.

• **The unit reduces reject and rework rates; lubricant is applied more often than by previous methods.**

The lubricator is used on a 500 ton hot forging press that makes a variety of brass and aluminum parts for the appliance, plumbing, hardware, aircraft, and automotive industries.

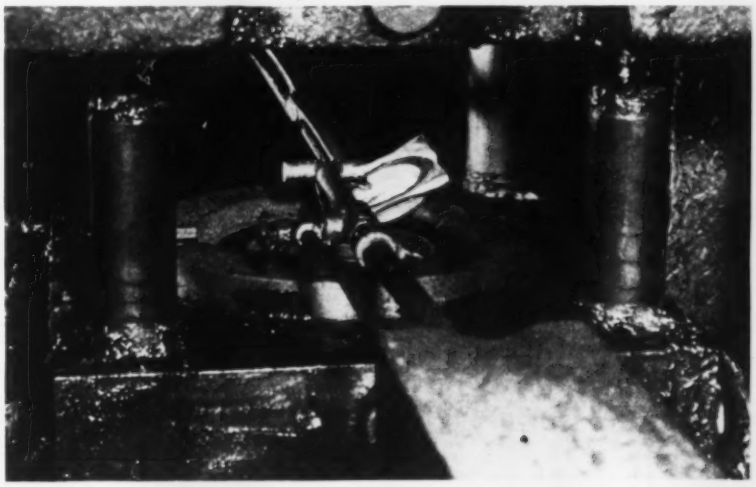
Automatic lubrication makes for better forgings and longer die life by lubricating the top die after every strike. Previously, it was lubricated by hand every ten strikes. Manufacturing costs are lower; rejects and rework have been cut 15 per cent.

• **Lubricant is sprayed on the dies while the press is open.**

The lubricator arm and nozzle are attached to an electrically controlled, air operated piston. Solenoids and limit switches keep the press from closing while the nozzle is over the die cavity.

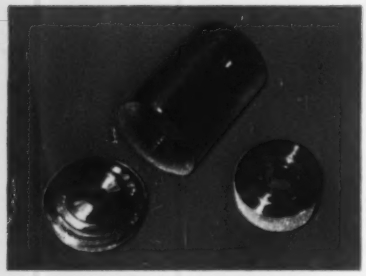
After a billet is forged and the press opens, the nozzle is moved into the die opening. It sprays a colloidal graphite and water lubricant over the top die. As the formed part is removed and another billet is inserted, the nozzle is retracted.

Nozzle moves into position to lubricate the die, as the press opens and forged part is removed. It's retracted when a new billet is inserted



Extruded Beryllium Offers . . .

- Greater strength and ductility
- Uniform density
- Improved machinability
- Better surface finishes
- A 10 per cent cut in costs



Extruded beryllium is playing an increasingly important role in missile guidance systems. Uniformity permits standardized production procedures

ROUTINE EXTRUSION of beryllium, just announced by Beryllium Corp., Reading, Pa., is expected to promote its use and reduce costs for users.

The firm cites these advantages:

1. Extrusion eliminates the machining of large blocks and resulting scrap. Production costs are trimmed about 10 per cent.

2. The product offers improved machinability. It's easier to get a fine surface finish which leads to improved tolerances, says American Beryllium Co., Sarasota, Fla.

3. Mechanical properties are better than those of material produced by the conventional vacuum hot pressing technique.

• The company starts with a powder metal billet encased in a steel jacket.

Until recently, the standard way to make large rods and bars was the vacuum hot pressing of minus 200 mesh powder. Smaller pieces were turned or milled from the large billets, and much machine scrap was generated.

Beryllium Corp. extrudes directly to final size, allowing only enough material to remove the as-extruded surface. Starting billets are 5 to 15 in. long and weigh 3 to 35 lb. Billets with only 95 per cent of theoretical density are turned out as finished pieces with 100 per cent density free of center line porosity.

A 3/16 in. steel jacket surrounds the billets to cut oxidation, minimize thermal shock, decrease die wear, and simplify handling. At 1650 to 2000° F, beryllium tends to adhere to the dies, with resulting galling. The metal can be extruded bare (without can) at 930° F, but pressures are too high. (Research people are looking into the possibility of bare extrusion at the higher temperatures by using special lubricants. If successful, it means the commercial production of bare beryllium extrusions as tubes and complex structural shapes for aircraft and missile applications. Northrop Corp., Hawthorne, Calif., is participating.)

• Lubrication, once a problem, was solved with a Bentonite-base grease with graphite in suspension used on both tools and liner.

The billet is heated in a resistance furnace to about 1850° F then transferred to the liner and extruded when the billet reaches the proper temperature. A tool steel pressing disc is placed over the open end of the liner to protect the ram.

The extruded rod, covered with a thin, uniform steel skin moves out of the die at 10 to 50 ipm. Extrusion ratios run 5 to 1 to 50 to 1.

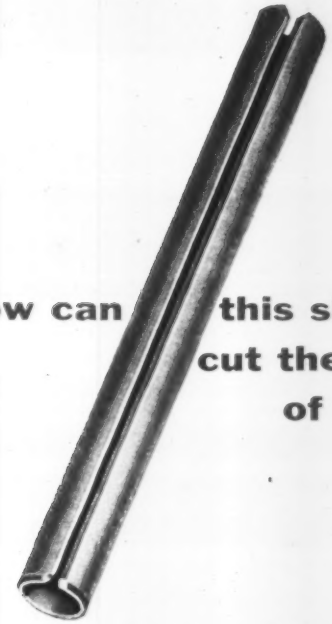
Rods and bars are hot straightened then cooled from 1450° F at 100° F an hour. They are removed when they reach 500° F. The treatment prevents cracking and relieves internal stresses. Steel jacketing can be removed mechanically or chemically.

• Beryllium Corp. is encouraged by its results in rolling large sheets.

Experimental work continues with hot forming of various shapes and casting billets for extrusion, rolling, and forging. Work with Wyman-Gordon Co., Worcester, Mass., shows promise in forging shapes directly from raw materials.

Physical Properties of Beryllium

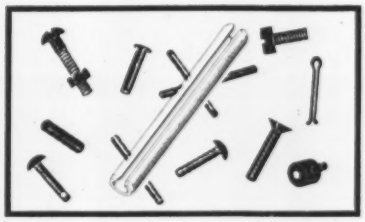
	Extruded	Hot Pressed
Tensile Strength	75,000 psi	40,000 psi
Yield Strength	50,000 psi	30,000 psi
Per Cent Elongation	6	1



How can this simple fastener cut the cost of your product?

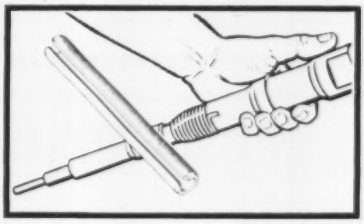
Rollpin aids standardization and reduces inventory

Rollpin readily replaces taper pins, grooved pins, straight pins and set screws; it can be used as a locating dowel, hinge pin, cotter pin, stop pin or, in some applications, even as a rivet. Thus, when you standardize on a Rollpin you can drastically reduce the variety of fasteners in your inventory—save money in purchasing, storage space and stock handling.



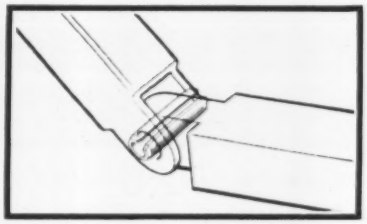
Rollpin simplifies production processing . . . saves man-hours

When you use Rollpin you can eliminate costly precision drilling, or tapping operations. And there's no need for any secondary locking operation—such as lock wiring or peening. That's because Rollpin is a slotted tubular steel spring whose chamfered ends drive easily into standard production-drilled holes, compressing as driven. The spring tension against the hole walls retains Rollpins securely against severe vibration. Independent studies have shown that installed costs of Rollpin are as much as *91% less* than those for a dowel pin or *95% less* than the installed cost of a taper pin.



Rollpin simplifies product maintenance

Only a drift pin or standard punch is required to remove a Rollpin. The slotted tubular shape and the spring action principle do not damage hole walls or enlarge the original hole diameter. Consequently the same pin is easily re-inserted and can be used again and again. Mail our coupon today for the complete Rollpin story.



ROLLPIN®

a product of
Elastic Stop Nut Corporation of America

Dept. R58-960, Elastic Stop Nut Corporation of America
2330 Vauxhall Road
Union, New Jersey

Please send the following free fastening information

- ☐ Rollpin bulletin
- ☐ ELASTIC STOP® nut bulletin
- ☐ Here is a sketch of a fastening problem. What ESNA® fastener would you recommend?

Name_____

Title_____

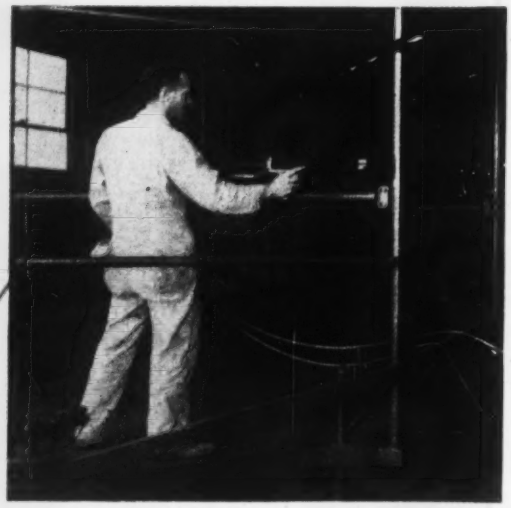
Firm_____

Street_____

City_____ Zone____ State_____

FASTER . . . CLEANER . . . MORE ECONOMICAL WHEN YOU PAINT WITH THE RANSBURG

Electrostatic Hand Gun



Gator Boat transport trailers are painted in less than half the time—with half the paint—with the new Ransburg Electrostatic Hand Gun.

For instance

Peterson Bros., Inc., Jacksonville, Florida and Ft. Wayne, Indiana, world's largest manufacturer of boat trailers for the Marine Industry, switched from air hand spray to Ransburg No. 2 Process Electrostatic Hand Gun at the Fort Wayne operation in the finishing of their big custom line boat trailers and their Gator line of Marine Trades Equipment.

Paint saving with the Ransburg Hand Gun is estimated at 50 to 60% over the former method. Construction of their products (they use a lot of tubular steel) is ideal for Hand Gun application because of the "wrap-around" characteristic of Electro-Spray.

Painting is done now in an open spray room where two water-wash booths stand idle. Not needed! Maintenance in the paint room has been reduced 75%, for where they used to have to clean up the room sometimes twice a week (mostly on overtime) it now goes two or three weeks without cleanup.

One of Peterson's biggest products now painted electrostatically is a boat transport trailer, Model 807, built to haul six 16-ft. runabout boats. The trailers are over 31-feet long; overall height is 11′-2″ and almost 8′ wide. With air spray, it used to take 8 hours, or more, to paint the big vehicles. Now, with Ransburg No. 2 Process Electrostatic Hand Gun, one operator does the job in only 3½ hours. And, with half the paint!

NO REASON WHY YOU CAN'T DO IT, TOO!

Write for information and literature about this revolutionary, new painting tool. See how the Electrostatic Hand Gun can save time . . . paint . . . and cut costs in YOUR finishing department. If your production justifies conveyorized painting, it'll pay you to investigate Ransburg's automatic electrostatic spray painting equipment. Write for our No. 2 Process brochure which shows numerous examples of modern production painting in both large and small plants.

RANSBURG

RANSBURG
Electro-Coating Corp.
Box-23122, Indianapolis 23, Indiana

Segmented Die Patent Now in Public Domain

A diemaking method for bolting segmented tungsten carbide parts to a softer metal has been declared public property by the U. S. Patent Office.

• **Advantages**—With this method manufacturers can have the advantages of tungsten carbide without paying for a solid tungsten carbide die. The interlocking parts are fastened so firmly to the base that parting lines are indistinguishable. The shape of each segment interlocks with adjacent segments so that any tendency to tilt or move sideways is prevented.

The inventor, George Banko, president, Cleveland Tool & Die Co., Cleveland, was granted a patent in 1947. (It was reissued in 1958.) It was dedicated for public use with the co-operation of Allegheny Ludlum Steel Corp.

Tough Nitrile Rubber Seals Coreboxes Better

A tough, effective method of sealing coreboxes in foundry operations has been developed and patented by Dike-O-Seal Inc., Chicago. The material (a nitrile rubber) not only reduces costs, but makes possible better cores, says the company. That means better castings with less scrap.

Present foundry practices call for cost cutting by blowing sand, under pressure, into coreboxes. Care must be taken, though, to prevent erosion of the contact or parting faces. Such erosion can result in finished casting flaws as well as damage to the box itself.

Tight seals are required. They must be flexible enough to fit complicated contact face outlines and tough enough to resist live steam, alkalis, and fuel oil used in cleaning coreboxes.

Dike-O-Seal selected the rubber (developed by B. F. Goodrich Chemical Co., Cleveland) for its unusual properties. The seal can retain resilience under extreme temperature changes and severe deformation. Abrasion resistance is unusually good and the material can withstand hydrocarbons and chemicals which destroy ordinary rubber.

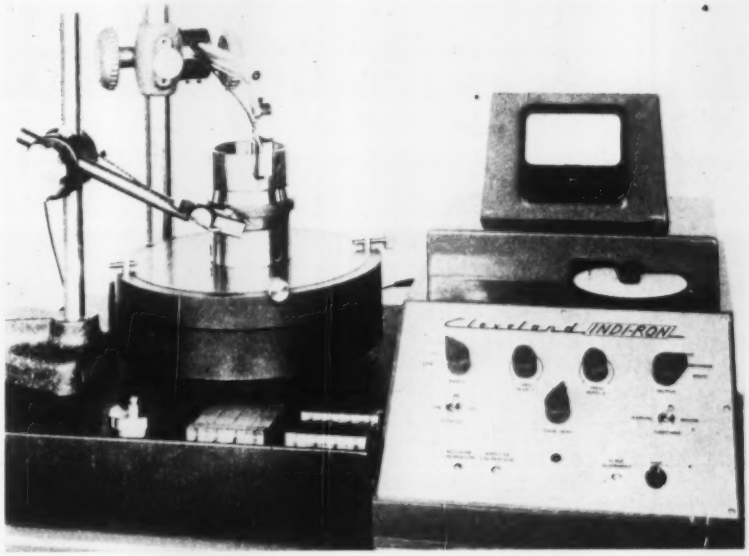
Gage Checks Roundness, Squareness in a Hurry

WITH the Cleveland Indi-Ron instrument, you can make these measurements to an accuracy of three millionths (0.000003) of an inch in a few minutes:

Roundness of any inside or outside diameter, concentricity of any inner or outer diameter to any other inner or outer diameter or any axis, alignment of any axis to any other axis, squareness of any face or flange to any other face or flange or any axis, flatness of any face or flange.

Fast, precise measurements are possible because the part is rotated while the gage head remains stationary.

The reference point is the axis of the ultraprecision spindle on which the part is held. The rotational and axial accuracy of the spindle is guaranteed to three millionths of an inch.



The gage can be used in the laboratory, in inspection, or in production. A controlled temperature room is not necessary. The Indi-Ron is available with turntable capacities to 18 in. OD and several hundred pounds in weight.

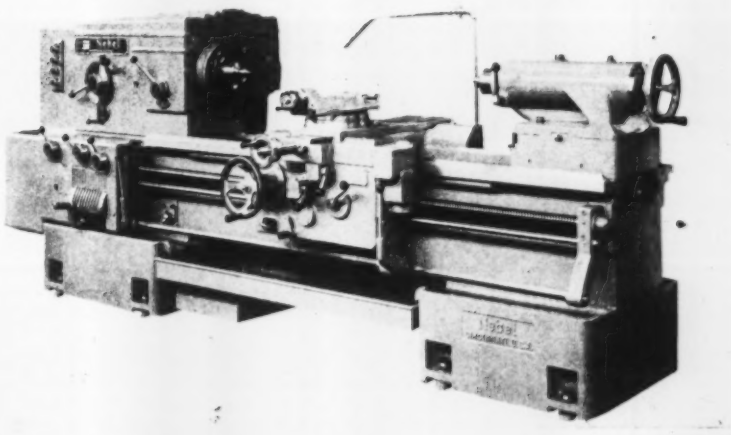
For more information, *write* Cleveland Instrument Co., 6220 E. Schaaf Rd., Cleveland 31, Ohio.

Heavy Duty Lathe Does Precision Machining

PRECISION machining and facing of heavy workpieces are simplified with the Model HD 2516 lathe. It has more and higher spindle speeds than ever available before in the Nebel machine line.

Eighteen gear driven speeds are selected from a direct reading color index, and controlled by two levers and color keyed speed plates. Speeds up to 1500 rpm are available with selective gear design engaging only the gears required.

The engine lathe features heavy duty construction throughout. The three-bearing spindle is mounted at the front and center supports on zero precision, angular tapered,



roller bearings. They're preloaded and adjusted for maximum radial and thrust loads. At the rear, the third bearing, a radial type, provides for longitudinal spindle expansion.

The heavy duty quick change box provides 60 feeds from 0.0027 to 0.192 in., and 60 thread changes from 1 to 72 threads per inch, including standard pipe threads. All are selected from a direct reading index plate.

Up to 20 hp is supplied by a constant speed main drive motor through a multiple disc clutch and brake mounted externally on the headstock.

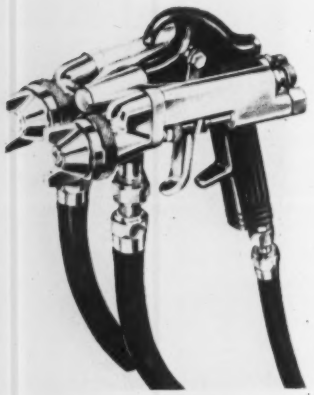
For more information, *write* Nebel Machine Tool Corp., Central Parkway, Cincinnati, Ohio.

Two Headed Spray Gun Applies Polyesters

HIGH efficiency spray application without excessive cost is possible with the Binks two headed spray gun.

Designed primarily for the application of polyester resins where the accelerator mixture must be brought into contact with the catalyst mixture immediately before the mixture impacts the work surface, the gun can also be put to other uses.

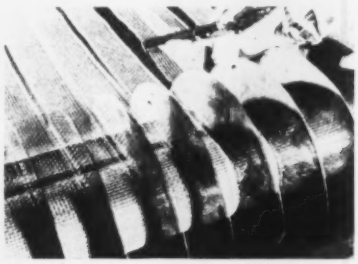
An example is in spattering or veiling where two different materials can be sprayed with each press of the gun. The gun can also be used for almost any two-component finishing system where perfect mixing is not required, or where premixing is impossible or impractical.



For more information, *write* Binks Mfg. Co., 3114 Carroll Ave., Chicago 12, Ill.

Braid Weave Gives Firm, Safe Edge to Wire Cloth

WIRE CLOTH woven with an integral flat braid provides a firm workable edge. The strengthened edge can be gripped, embedded, or otherwise fastened by methods previously impractical with wire cloth.



Braid weave is made by including a flat braid as a warp (lengthwise) wire. The wire cloth is hot dip galvanized after weaving, and is then slit through the braid to the reinforced edge. Cross wires are held firmly in place and the edge of the slit cloth is structurally strengthened by the braid.

The cloth is available in 2 mesh to 8 mesh. It is woven up to 48 in. wide and may be slit from 2 to 12 in. wide.

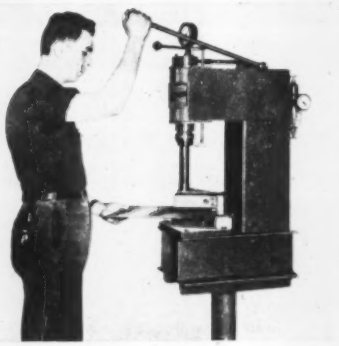
For more information, *write* Reynolds Wire Div., National-Standard Co., Dixon, Ill.

10-Ton Bench Arbor Press Has Speed, Versatility

AN AIR-ACTUATED, fast ram approach is featured on KRW's new 10-ton hand operated, hydraulic bench, arbor press.

Adaptable to a wide range of bending, straightening, forming, and punching applications, it can be operated at more than 20 strokes a minute.

When the hand operating lever is raised, the ram comes down to meet the work in a fraction of a second. When the hand lever is



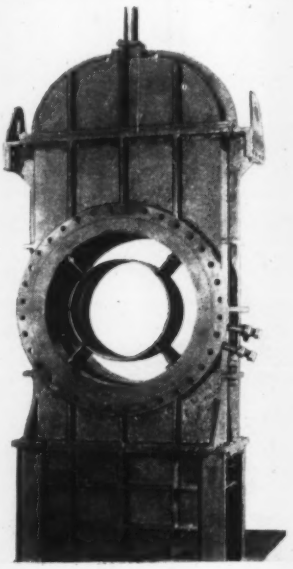
lowered, hydraulic pressure is applied to the work. Once the job is done, the ram is quickly spring-returned to top position by flipping the pressure release knob above the pumping unit.

For more information, *write* K. R. Wilson Inc., Arcade, N. Y.

Blast Furnace Stove Valve Closes Quickly

ONLY 11 seconds are required to fully close this water cooled valve when it is in fully open position. It is intended to replace components which require 2 minutes or more for operation.

Designed to reduce greatly the time required for changing blast furnace stoves, while assuring a gastight seal, the Bailey gas burner shutoff valve is mounted directly to the stove. It bolts tight to the burner and stove saddle, preventing gas leaks at the burner. The unit's



motor operated drive unit and push-button controls are located on a platform well above the valve and clear of stove heat.

The valve body and disc are water cooled to protect the parts in operating temperatures which range to 1900° F and more. The valve is available in sizes 32, 39, 48, and 56 in. in diameter for burning 12,000 to 35,000 cfm of gas. It is applicable for use with pushbutton operation or on complete automatic stove change systems.

For more information, *write* William M. Bailey Co., 1221 Banksville Rd., Pittsburgh 16, Pa.

Epoxy Enamel Stripper

STRIPPING costs can be substantially reduced and evaporation losses minimized without sacrificing the advantages of room temperature stripping when using Stripper-26, states the manufacturer.

It performs all of the functions of cold, chlorinated strippers and can be diluted (up to 20 parts by volume of water). It is acidic and nonflammable.

The material acts by wrinkling and detaching the enamel from the basis metal. New, hard-to-strip epoxy coatings are removed from most metals, including steel, aluminum, copper, brass, and zinc diecastings. The product is also effective for stripping of plastisol coatings from racks.

For more information, *write* Enthone Inc., subsidiary of American Smelting & Refining Co., New Haven, Conn.

Degreasing Machine Cover Can Cut Solvent Losses

WASTEFUL and costly evaporation losses of degreasing solvents used in metal finishing operations can be minimized by adding the Baron Econ-O-Lid, a roll type cover.

The cover attaches easily to vapor spray degreasers of every size and manufacture. A flick of the finger rolls the lid across the top

NEW *from* SEALMASTER®

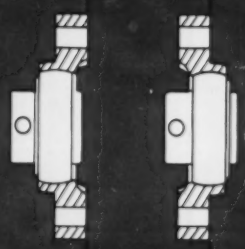
ECONOMY PERFORMANCE QUALITY

LFT 2-BOLT FLANGE UNIT

LF 3-BOLT FLANGE UNIT

- Precision self-aligning one-piece unit. No extra assembly costs for you.
- Malleable housing provides maximum strength with light weight.
- Permanently sealed — prelubricated with high grade lubricant.
- Nothing of comparable value in low price field.
- Reversible for flush or recessed mounting.

REVERSIBLE FOR FLUSH OR RECESSED MOUNTING



AVAILABLE IN A COMPLETE SERIES

LF PILLOW BLOCK · E BEARING · SL BEARING · LFT FLANGE UNIT · LF FLANGE UNIT

AVAILABLE IN SHAFT SIZES ¾" THRU 1 7/16"

SEALMASTER BEARINGS
A DIVISION OF
STEPHENS-ADAMSON MFG. CO.
99 Ridgeway Avenue • Aurora, Illinois

WRITE FOR BULLETIN 359

PLANTS LOCATED IN: LOS ANGELES, CALIF. • CLARKSDALE, MISS. • BELLEVILLE, ONTARIO

of the machine to a completely open or closed position. When in the closed position, solvent vapors are locked inside the machine. When rolled back to the open position, full access to the work area is provided.

Field tests have shown that the Baron Econ-O-Lid will cut solvent losses from 30 to 60 per cent. It is made of a tough, specially coated

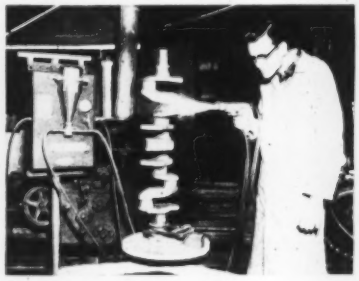
material that is resistant to all trichlorethylene solutions.

For more information, *write* Baron Industries, 241 West Ave. 26, Los Angeles 31, Calif.

Crankshaft Metal Spray Is Tough, Has Long Wear

WORN engine and compressor crankshafts can be quickly rebuilt with an easy to apply, tough, long wearing, metal spray powder. Designated Colmonoy C-290, the material is high in chromium and nickel and contains wear resistant chromium borides.

The powder is applied with the Colmonoy Spraywelder unit, but is not subsequently fused as in the Sprayweld process. Finish grind-



ing of the sprayed journal completes the procedure. The resulting tough metal spray overlay produces longer crankshaft life.

For more information, *write* Wall Colmonoy Corp., 19345 John R. St., Detroit 3, Mich.

Grinding Coolant Has High Dilution Ratio

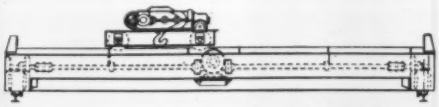
GREATER economies for grinding operations on carbon and tool steels, cast iron, and titanium, as well as tool grinding where surface finish is determined by the structure of the wheel, are claimed for a soluble grinding coolant, designated A-1000.

Prepared as a concentrate with permissible dilution ratios ranging up to 150:1, the coolant provides exceptional economy with no loss in lubricity or solution stability. Wheel life is increased, downtime and wheel dressings are reduced. The material leaves no powdery deposits on the critical machine surfaces.

The machine itself does the necessary mixing; no special procedure is required.

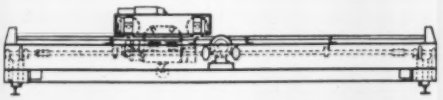
For more information, *write* Shear-Speed Chemical Products Div., Michigan Tool Co., 7125 E. McNichols Rd., Detroit 12, Mich.

STANDARD HEADROOM
Provides highest hook height with top-running trolley and foot mounted hoisting unit.



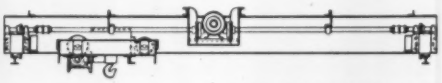
Model DTMD—TT

MEDIUM HEADROOM
Here the hoisting unit is rigidly suspended from the top-running trolley to reduce clearance over rail.



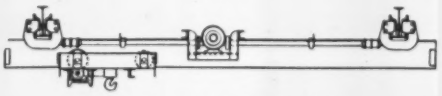
Model DTMD—LT

LOW HEADROOM
Under-running trolley permits unusually high hook lift. Use it where clearance under bridge must be maximum.



Model DTMD—UT

SUSPENDED TRACK
Operates on lower flange of crane runway suspended from roof guiders or other overhead support. Use also where load transfer is desired.



Model DUMD—UT

there is a

CRANEMASTER

for any building condition

***Send For* BULLETIN C-110**

Describes in detail the many design and operating advantages of CRANEMASTER overhead traveling cranes. Also explains how Abell-Howe provides competent service from original survey to final installation.

ABELL-HOWE COMPANY 7747 Van Buren Street • Forest Park, Illinois

NEW literature

Write directly to the company for a copy

Foundry Melting Method

Information on how to get the most from crucible melting is contained in a pamphlet, "Crucible Charlie." Crucible Manufacturers Association, 11 W. 42nd St., New York 36, N. Y.

Phosphor Bronze Catalog

A 20 page catalog discusses the composition, specifications, and properties of the various phosphor bronze alloys. Publications Section, Riverside-Alloy Metal Div., H. K. Porter Company Inc., Riverside, N. J.

Brush Maintenance Manual

A 16 page booklet, CP-3004, contains practical tips on brush operation and maintenance on high current, low voltage generators used in electrolytic processes. National Carbon Co., 535 Fifth Ave., New York 17, N. Y.

Ingot Iron Tubing

Ingot iron tubing, characterized by ductility, toughness, and high magnetic permeability, is described fully in Data Memorandum No. 18. Superior Tube Co., 1585 Germantown Ave., Norristown, Pa.

New Rubber Compound

Brochure S-5125 discusses Neothane castable polyurethane rubber. Dept. 794, Goodyear Tire & Rubber Co., Akron 16, Ohio.

Selective Electroplating

"Selective Plating with the Dalic Process" is a 4 page brochure describing that process of electroplating selected areas without using immersion tanks. Sifco Metachemical Inc., 935 E. 63rd St., Cleveland 3, Ohio.

Pyroceram Materials

An 8 page brochure gives a general description of two types of a glass-ceramic called Pyroceram. Included are electrical, mechanical, thermal, and chemical properties. Corning Glass Works, Corning, N. Y.

Belt Conveyor Selection

A total of 22 components and accessories are listed in "Pre-Bilt Sectional Belt Conveyors," Book 2779. It also gives detailed engineering and selection data. Dept. PR, Link-Belt Co., Prudential Plaza, Chicago 1, Ill.

Heat Exchanger Data

Bulletin B-20, covers the design and application of exchangers for heating, cooling, condensing, and vaporizing. Struthers Wells Corp., Warren, Pa.

Metal Packing

Bulletin AD-166 contains data for correct selection, application and installation of metal packing for pumps, engines, and compressors. Garlock Packing Co., 438 Main St., Palmyra, N. Y.

Hydraulic Valve Manual

Rivett Manual No. 230 describes the operation and application of pressure controlled hydraulic valves. Rivett Inc., Brighton 35, Boston, Mass.

Electric Wire Rope Hoists

A booklet covers recommended minimum standard hoist specifications. Hoist Manufacturers Association Inc., 1 Thomas Circle, Washington 5, D. C.

Studwelding Applications

More than a dozen widely varied studwelding applications are shown in a 12 page booklet on "Reversing the Trend in Production Costs." Nelson Stud Welding Div., Gregory Industries Inc., Lorain, Ohio.

Platinum-Group Metals

An 8 page brochure lists the physical and chemical properties of solid and clad platinum-metal products. Metals & Controls Div., Texas Instruments Inc., 34 Forest St., Attleboro, Mass.

Aluminum Casting Handbook

A 32 page reference book includes complete information on various casting processes suitable for aluminum. Dept. PRD-17, Reynolds Metals Co., Box 2346, Richmond 18, Va.

Semiconductor Rectifiers

A paper gives an explanation of the uses and types of industrial rectifiers. Perkin Engineering Corp., 345 Kansas St., El Segundo, Calif.

Steel Service Centers throughout the country have built up their inventories in anticipation of a suspension in steel production. These stockpiles totaling almost 3,600,000 tons are valued at ¾ billion dollars. If you have been using a steel service center as your source of supply—you can thank your lucky stars—because chances are they will still be able to fill your requirements.

Each distributor's representative is a metal specialist and is qualified to assist you with application and supply problems.

MICROROLD STAINLESS STEEL is regularly carried in stock in 252 of these independent steel warehouses. Washington Steel is a producer of sheet and strip exclusively, all of which is precision rolled on Sendzimir mills.

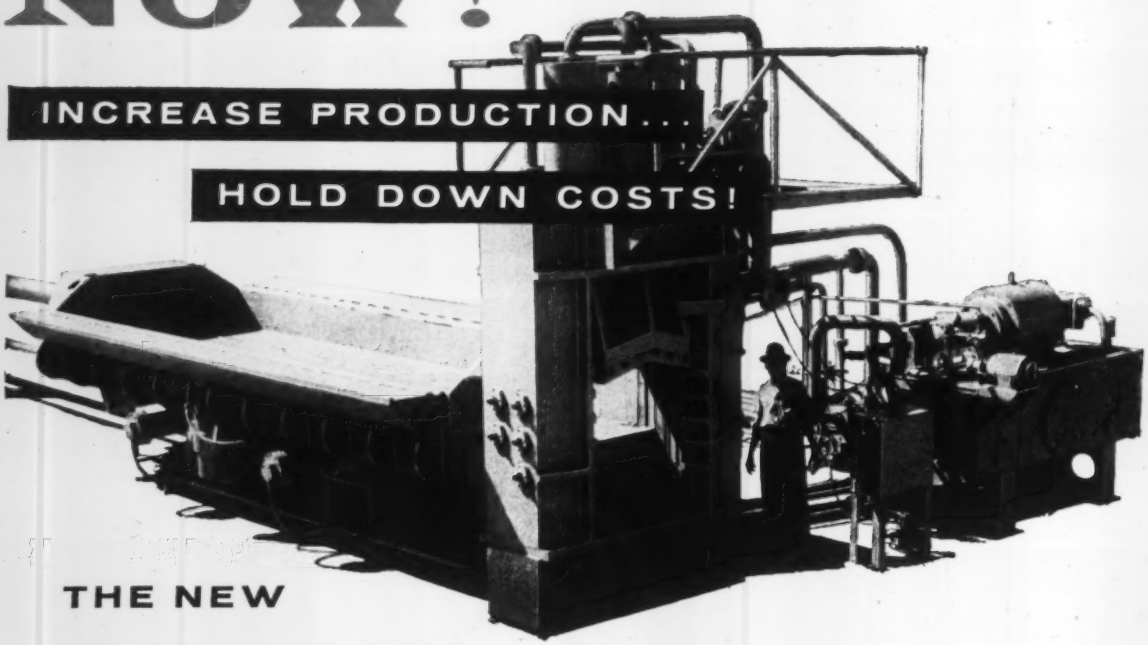
WASHINGTON STEEL CORPORATION

91-O Woodland Avenue, Washington, Pa.

MODERNIZE NOW!

INCREASE PRODUCTION...

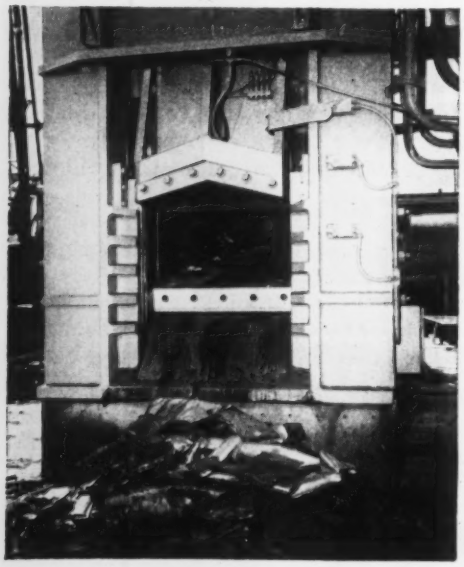
HOLD DOWN COSTS!



THE NEW

HARRIS BS-350 BALER-SHEAR

AUTO FRAMES and bulky scrap work through easily. The Harris Baler-Shear was designed to eliminate problems arising from the preparation of bulky scrap. It incorporates the principles of baling and shearing.



SPECIFICATIONS

size of charging box	264 x 83 x 41"
shear opening height	20"
shear opening width	36"
shear force	350 tons
floor space required	55' x 20'

HARRIS FOUNDRY & MACHINE CO.

Hydraulic Engineers Since 1889

CORDELE, GEORGIA

Talk with a Man from Harris

September 7, 1959

Worst Hardships May Come After Strike

STEEL SHORTAGES will be troublesome within a week, serious by the end of the month, and dangerous to the economy if the strike runs into October.

At the rate inventories are being depleted (about 1 million tons a week), they'll be down to the minimum working level of 14 million tons by Oct. 7. Even if the strike is settled by then or halted by Taft-Hartley injunction, the inventory situation will get worse before it gets better. The most severe hardships will be felt after the steelworkers go back to work. Here's why:

If the strike ended Sept. 21, producers would be lucky if they could pour ingots, make slabs, inspect them, and get ready to roll by Oct. 5. Processing wouldn't begin before Oct. 12. Double annealing (of high carbon and stainless grades) and finish rolling would take two or three weeks more.

SLOW STARTUPS EXPECTED— But suppose there are complications. What if furnace roofs fall in when the heat is turned up again? Maintenance and repairs were held to a minimum during the first half in the interest of all-out production. Steelmakers won't resume full operations until they've caught up on deferred maintenance and replaced worn out equipment. Slow startups will add to users' woes.

DETROIT SHOWS CONCERN— Although automakers have big stockpiles of the steel they use in quantity, spot shortages of items used in trim may halt 1960 model runs sooner than many observers realize. Auto executives are beginning to show some interest in conversion deals because they fear slow shipments after the strike.

FOURTH QUARTER BOOKINGS— For the most part, steelmakers are discouraging fourth quarter business. Because of their huge backlogs, the best they can do is assure regular customers: "We'll have some tonnage for you," and "we'll try to get current as fast as we can." If the strike lasts much longer, cold rolled and galvanized sheets may be on allocation for six or eight months after production is resumed.

SIGNS OF TIMES— Top steel executives are getting telephone calls that would normally be routed to district sales offices. Customers who didn't book third quarter tonnage as a precautionary measure are beseeching steelmakers to give them priority on fourth quarter books.

TUBEMAKERS' DILEMMA— Major oil companies and distributors have enough steel on hand to sustain drilling operations for the next 30 days. Although some of the small, independent oil producers are beginning to feel the pinch, they're still able to get what they need by borrowing. Steelmakers are wondering whether they should give distributors priority after the strike (because so many small users depend on them), or whether they should concentrate on direct shipments to big consumers.

PRODUCTION STEADY— Last week, steelmakers operated their furnaces at 12 per cent of capacity, up three-tenths of a point from the previous week's revised rate. Production was about 340,000 ingot tons. Output during August was only 1,450,000 tons (vs. 5.2 million in July and 10.9 million in June).

WHERE TO FIND MARKETS & PRICES

	News	Prices
Bars, Merchant	117	123
Reinforcing	115	124
Boiler Tubes	...	*
Canada	...	*
Clad Steel	...	127
Coke	...	129
Coal Chemicals	...	129
Charts:		
Finished Steel	...	122
Ingot Rate	121	...
Scrap Prices	...	134
Comparisons	...	122
Electrodes	...	129
Fasteners	...	126
Ferroalloys	...	130
Fluorspar	...	129
Footnotes	...	126
Imported Steel	116	129
Ingot Rates	121	...
Metal Powder	...	129
Nonferrous Met.	136	138
Ores	...	129
Pig Iron	121	128
Piling	...	123
Plates	116	123
Plating Material	...	139
Prestressed Strand	...	126
Price Indexes	...	122
Producers' Key	124	...
R.R. Materials	...	126
Refractories	...	129
Scrap	133	134
Semifinished	...	123
Service Centers	117	128
Sheets	117	124
Silicon Steel	...	125
Stainless Steel	121	127
Strip	117	125
Structurals	121	123
Tin Mill Prod.	118	125
Tool Steel	...	127
Tubular Goods	117	127
Wire	...	125

*Current prices were published in the Aug. 31 issue and will appear in subsequent issues.

For FASTER CUT-OFF SAWING at the LOWEST COST-PER-CUT

the

ALL NEW

Milband

BAND SAW MACHINE TOOL

- FAST CUTTING WITH EXTREME ACCURACY
- NARROWER KERF MEANS REDUCED CHIP LOSS
- MINIMUM BLADE STRESS, MUCH LONGER BLADE LIFE
- CUTS ARE CONSISTENTLY STRAIGHT, SMOOTH, ACCURATE

ADVANCED DESIGN

- RUGGED CONSTRUCTION WITH RIGID, OVERSIZED BLADE WHEELS
- FULLY AUTOMATIC OPERATION
- WIDE RANGE OF INFINITELY VARIABLE BLADE SPEEDS
- CONVENIENT, CENTRALIZED CONTROLS
- FAST-ACTING HYDRAULIC VISE
- RECIRCULATING COOLANT SYSTEM

The Blade Behind the Machine

... is the MILFORD REZISTOR High Speed Steel Band Saw Blade. Ideal team-mate for the MILBAND Machine Tool, this blade is made from red-hardness steel, outlasts ordinary carbon steel blades many times, and production-saws stainless steel and other tough alloys these blades cannot cut.

SPECIFICATIONS

Blade Speed Range	40 to 360 fpm, infinitely variable
Blade Feed	hydraulic, with compensating flow for work section variations
Motor	3 hp drip-proof with oil-tight push button controls
Blade Guides	carbide, individually adjustable
Blade Tensioning	hydraulic, with tension maintained automatically
Work Receiving Table	25½" x 26½"
Machine Dimensions:	
Width, Including Vise Guard	43½"
Length	93"
Height, Head Down	55"
Height, Head Raised	65"
Bar Feed Dimensions:	
Width, Including Vise	49½"
Length	73"
Weight of Machine and Bar Feed	3000 pounds
Blade Type and Size	MILFORD REZISTOR High Speed Steel Band Saw Blade, 1" x 15'

SAW & BAND SAW BLADES · STOCK · HOLE SAWS · HACK · GROUND FLAT

MILFORD

WRITE NOW FOR DESCRIPTIVE LITERATURE

Saw Specialists For Over 80 Years

The HENRY G. THOMPSON & SON CO.

MACHINE TOOL DIVISION • 277 CHAPEL ST., NEW HAVEN 5, CONNECTICUT

DIRECT REPRESENTATIVES AND DISTRIBUTORS IN PRINCIPAL CITIES

Titanium sheet bars head into a furnace at Mallory-Sharon Metals Corp. for heating prior to rolling. Mallory-Sharon produces finished sheets and mill shapes for industrial customers in its now-integrated production facilities

Titanium Maker Changes to Civvies

NOT LONG AGO, troops of publicity men and photographers assembled in a number of hotel kitchens across the country to watch a unique egg frying derby. The chefs they watched were flipping eggs in shiny, titanium frying pans.

To Mallory-Sharon Metals Corp., Niles, Ohio, a producer of titanium and zirconium, the egg frying signifies the start of a new campaign to win industrial and consumer markets for special metals. President Frank H. Vandenburgh, however, explains that his firm has no plans to make frying pans: "Our long range objective is to make titanium, zirconium, and other special metals as well known to the buying public as steel and aluminum. We intend to explore and exploit every market potential for these metals which looks even faintly feasible."

Mr. Vandenburgh's goals will take some real doing. Mallory-Sharon, formed in 1951 and nurtured mostly by then-booming defense spending for titanium, skidded close to the bottom two years ago when military cutbacks were made and the titanium market all but collapsed. Now, battered, bruised, but wiser, Mallory-Sharon has taken a new tack to survive.

• Titanium was hailed in the early fifties as the wonder metal of the age.

Early research claimed it was half as heavy as steel, just as strong, and corrosionproof. Government forecasters predicted needs up to 200,000 tons a year; the U. S. told aircraft companies to specify titanium wherever possible to encourage use of the new material. The B-52 heavy bomber program required 3000 lb of titanium for each engine, with each aircraft requiring eight operating engines and two spares. The industry was born almost overnight.

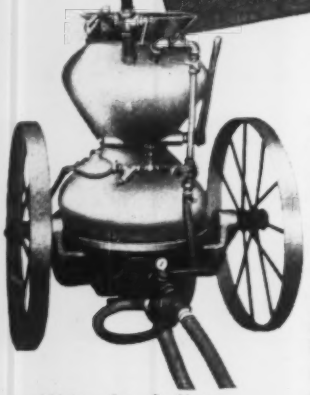
Organized in 1951 as Mallory-Sharon Titanium Corp., Sharon Steel Co. united its special alloy steel rolling mills at Niles, Ohio, with the special metals research knowhow of P. R. Mallory & Co. Inc., Indianapolis, a producer of ductile tungsten for electric lights, and electronic products. By March, 1957, the firm was operating ingot melting and rolling facilities at capacity.

• The bubble burst in 1957 before the metal was thoroughly proved.

Comparatively little was known about titanium outside its uses in jet engines and airframes. Questions were raised in some applica-

Save! ON FURNACE REPAIR and REFRACTORY INSTALLATION

THE "CEMENT GUN"® METHOD

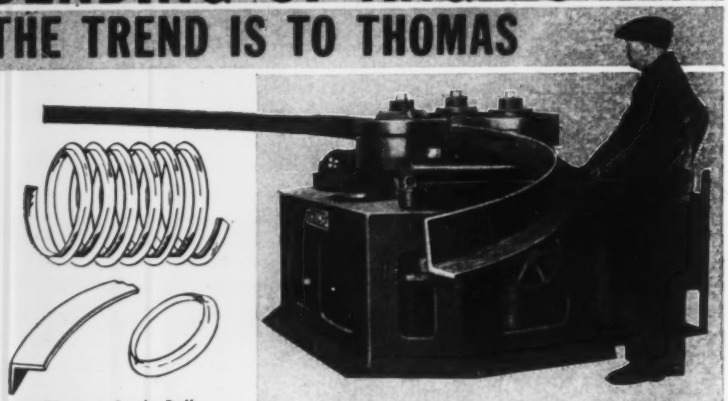


The CEMENT GUN is simple to operate; two or three of your own men can learn quickly and easily, after which they can make all your refractories repairs. With the CEMENT GUN they can place a lining 1" to 6" thick in one continuous operation. They can make patches in a "hot" furnace. They can place up to 5 thousand pounds of refractory material an hour. The CEMENT GUN method saves down time, saves material and extends the life of your present linings. Write today for further information.

Write for Bulletin No. 3000-B Today!

CEMENT GUN COMPANY
Gunite Contractors
1518 Walnut Street • Allentown, Pennsylvania

FOR SEGMENT OR CIRCLE BENDING OF ANGLES
THE TREND IS TO THOMAS



Thomas Angle Rolls will handle angles up to 6 x 6 x 7/8"

Thomas Angle Benders are of all steel construction and come in two styles and four sizes. Standard rolls permit "leg in" and "leg out" bending of angles. The machines may be converted for bending flats, rounds, squares, beams, channels, pipe and other shapes.

THOMAS MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

Write for Bulletin 314-A

tions as to its workability and machinability. At the same time, the B-52 engine program was stretched out as the material proved more durable than anticipated; new design specifications for the jet age went beyond the proven capabilities of titanium.

Mr. Vanderburgh laid the ills of the industry to several factors: "For one thing, our whole productive research and sales effort was aimed at one market, subsonic aircraft. For another, titanium was not adequately researched for diversified applications before heavy production began. We knew, for example, that titanium would hold its strength up to 700 or 800° F. But when air vehicle design specifications exceeded those temperature ranges, titanium was temporarily not useful. Titanium never failed. Design specs simply went beyond it."

Mallory-Sharon was faced with the decision to bail out of titanium altogether, as some competitors did, or to reconstitute the company and its objectives. At the close of 1957, the parent companies decided to start out again, this time with integrated production from raw material to mill shapes, and with broad new development programs for titanium and other special metals.

• Addition of titanium and zirconium sponge recovery facilities made Mallory-Sharon an integrated producer.

National Distillers Corp. came into the firm. It operates sponge recovery facilities at Ashtabula, Ohio. Its U. S. Industrial Chemicals Div. plants recover titanium and zirconium sponge from raw ore, using a sodium reduction process exclusive with National Distillers.

A name change to Mallory-Sharon Metals Corp. came in January, 1958, reflecting the company's new interest in other special metals. Revision of research budgets will provide for close scrutiny of such metals as columbium, tantalum, tungsten, molybdenum, and hafnium.

• With a still depressed demand for titanium, the firm faces a long period of slow growth.

At present, titanium sponge producing capacity in the U. S. is

about 27,000 tons annually. Against this capacity, some 5500 tons of sponge will be required to produce 3500 tons of titanium mill shapes this year. Mallory-Sharon estimates that sponge production, on an industry-wide basis, will be only 25 to 35 per cent of capacity.

In 1958, only 2500 tons of titanium mill shapes were produced by the whole industry. In 1957, output soared to 5600 tons; in 1956, it slipped a little, to 5300 tons. Mallory-Sharon estimates it will take the industry five years to reattain the production peak of 1957.

With a titanium ingot melting capacity of 6000 tons annually, Mallory-Sharon expects to operate this year at no more than 17 per cent of capacity. But it is raising its sights since grabbing 20 per cent of the market last year. Current industrial customers include anodizers, metal treaters, one pump and valve maker who produces a complete titanium line, manufacturers of heat exchangers and tubing.

Mallory-Sharon expects revenue this year to jump 20 to 25 per cent from its sales of titanium, zirconium, and the processing of special alloy steels. Meanwhile, research in the other special metals goes on; Mallory-Sharon will not again risk losing new markets with underresearched material. "From now on," says one official, "we'll put as many eggs in as many baskets as we can find. If half of them hatch, we're in business."

Gets Tantalum R&D Work

National Research Corp., Cambridge, Mass., has been awarded a contract for research and development on tantalum and tantalum-tungsten metal alloys for use as nozzles and other parts in high performance solid fuel rocket propulsion systems. The contract was awarded by U. S. Navy Bureau of Ordnance, Washington.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 124

This is the height of the building season, and demand for reinforcing steel continues unabated. Bar mills still operating on extended or unexpired labor contracts are turning

NEWS
from Torrington on
SMALL PRECISION METAL PARTS

Ordinarily, one would not think of "custom manufacture" and "mass production" in the same breath. Except at Torrington's Specialties Division, where the production of tremendous varieties and quantities of small metal parts of exceptional precision and uniformity is a day-to-day occurrence.

A good example is the valve stem we make for a leading pump manufacturer. Operations include turning, threading, slotting and tempering. Nothing unusual about that, except that Torrington can do it to such precision that the specified finish of 4 to 6 micro-inches is achieved without grinding. This saves our time—and our customer's money, yet every part is produced to perfection.

Another interesting case is an insulated contact pin. It is driven into

wood to check moisture content by electrical conductivity. The reduced center section is insulated. The shank must be accurate to ±.0005", and the diameter of the tapered neck to +.005", −.000". Torrington's engineers devised a way to back-swage the neck to required taper and trim square between head and reduced section *automatically*.

The manufacture of such parts as these, in the tremendous quantities required of us every day, demands highly specialized engineering skills. To serve you most efficiently, our Specialties Division maintains a separate engineering department. Staffed with engineers who have wide experience in precision metalworking, the department can help you with any engineering problems that might arise

in the manufacture of your special metal parts. For prompt service, just circle our number on the reply card, call our area salesman or write direct to:

The Torrington Company, Specialties Division, 900 Field Street, Torrington, Conn.

TORRINGTON SPECIAL METAL PARTS

Makers of Torrington Needle Bearings

out as much tonnage as they can. Demand is noticeably heavier than it was at this time last year.

Mesh production for some producers is heaviest on record. They can easily sell more than they are producing.

Plates . . .

Plate Prices, Page 123

Platemakers still operating are booking new tonnage for delivery through November. At least one mill has not opened its books for December, advising its regular customers they will be protected on normal requirements. By waiting until later to accept December tonnage, the mill thinks its customers can better gage their exact requirements.

Most strikebound mills are accepting contracts for processing in the order received, but with a view to protecting regular customers and restricting requirements to their usual patterns.

Although still relatively small percentagewise, an increasing number of government rated orders is appearing. This applies particularly to the alloy grades, for which demand from regular commercial customers is also increasing.

Imported Steel . . .

Imported Steel Prices, Page 129

Steel consumers in the Southwest are living off fat inventories and imported material.

While foreign mills are on allocation, they are confirming fourth quarter orders. Foreign quotations are still competitive with prestrike U. S. prices and in many cases are lower. A warehouse operator, listing one example, said he ordered strip for fourth quarter delivery from a Belgian mill at 92 cents per 100 lb under prestrike domestic prices.

The price structure for imported steel purchased directly from mill depots, brokers, and speculators is not clearcut. One Houston user told of paying 40 per cent over the prestrike price for plates and 8 per cent more for structural items. Generally, though, price lists from mill depots stocking imported steel show quotations are at prestrike domestic levels or slightly higher.

Foreign steel is coming into Great Lakes ports via the St. Lawrence Seaway. Foreign steel for the Niagara power project (lightweight items for fabrication into power line towers) is arriving at Buffalo (from Italy).

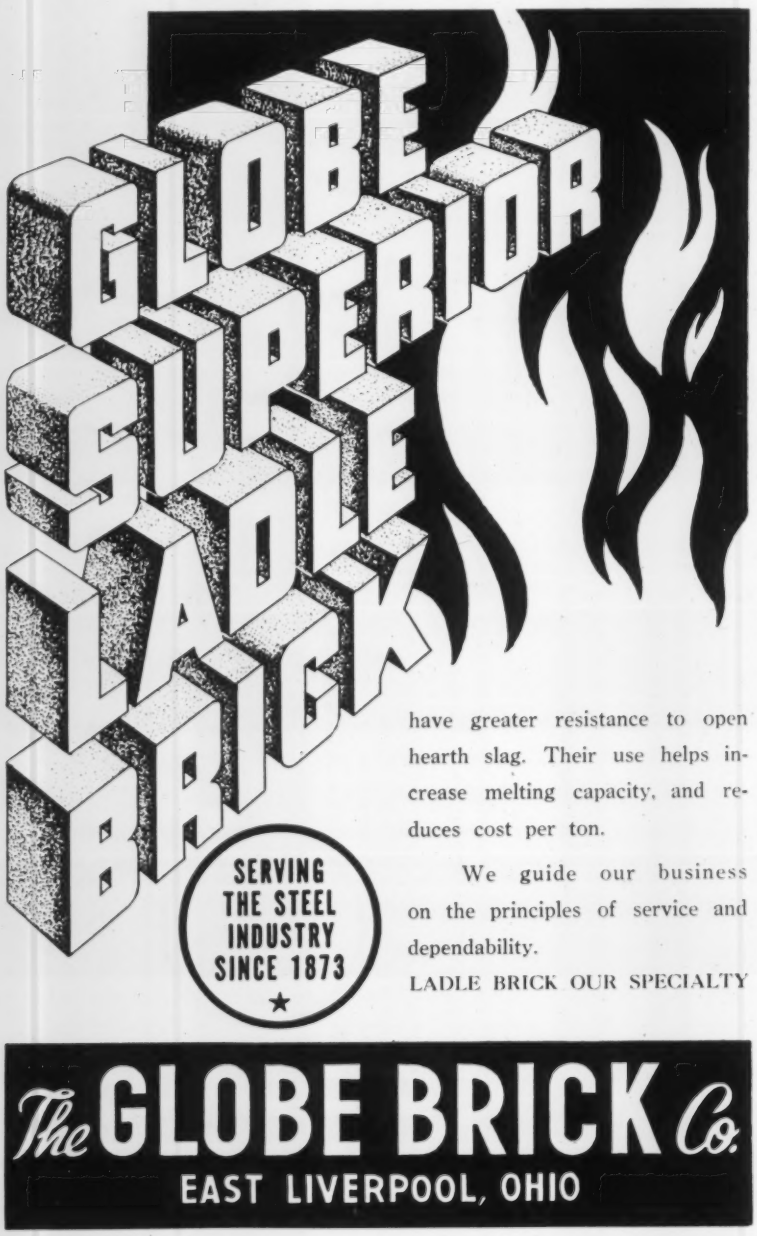
Little importing of Canadian steel has been noted since the start of the steel strike.

The St. Lawrence Seaway is prompting the establishment of import steel depots in the Midwest.

Metron Steel Corp., a division of Metron Inc., Chicago, has opened a depot at Calumet Harbor. It will be operated by the Calumet Harbor Terminals Inc. Dock and inside storage facilities are available. Bars, structural shapes, plates, reinforcing bars, nails, and wire products will be carried in stock the year round.

For the last 12 years Metron has specialized in importing. It is bringing in steel directly from Europe, where it maintains an overseas office. The company is planning depots at other Great Lakes ports.

A new firm, Seaway Trading Corp., has been organized in Minneapolis to import steel. It will be the importing division of General



Steel Inc., that city, which is withdrawing from the steel fabricating business to concentrate on warehousing.

Steel Bars . . .

Bar Prices, Page 123

Inquiry for hot carbon bars is increasing, and indications are the mills will have sufficient business on their books to assure capacity operations for several months, once the strike is ended and production is resumed.

While some capacity would be open in the fourth quarter schedules if the strike were to end shortly, few in the industry think a resumption of production is likely before Oct. 1.

Producers of cold drawn bars can still meet most requirements of customers for fairly early shipment.

Tubular Good . . .

Tubular Goods Prices, Page 127

Major consumers and distributors have enough steel pipe on hand to sustain oil drilling operations for the next 30 days. Some small oil producers are being pinched for steel supplies, but they're still able to fill their needs by borrowing.

Oil country items in shortest supply are small diameter tubes and 4½ and 5½ in. OD casing. Most activity seems to be centered in the Houston area. At Kansas City, Mo., distributors' sales are slow.

Hughes Tool Co.'s survey shows 2140 rotary rigs were working during the week ended Aug. 24, down six from the preceding week, but up 229 from a year ago.

Pipemakers have opened their books for fourth quarter orders. Unless the strike is settled soon, chances are they will be sold out for the balance of the year by Oct. 1.

Distributors . . .

Prices, Page 128

Pressure on service centers is increasing steadily and will become stronger each week as long as the major portion of the steel industry is strikebound. Part of the increased demand is attributed to the resumption of operations at fabricating plants following summer slowdowns, part to the steady drain on consumers' supplies which cannot be replenished by mills.

Some gaps are beginning to appear in distributors' inventories. Galvanized sheets are in shortest supply in most districts; wide flange beams and structural angles are in shortest supply in some areas, including Pittsburgh. Plate inventories are getting low in certain sizes and gages.

Some service centers have been struck by the United Steelworkers. Those whose doors remain open are taking care of established customers before accepting orders from others.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 124 & 125

Auto builders are starting to talk about fourth quarter steel requirements. With few mills in position to book additional business, it's not surprising that rumors are circulating to the effect the automen are displaying interest in conversion steel.

That is not taken as an indication the automakers are short of steel to get their new models roll-

New Invention Picks Up 40 Cu. Yd. Detachable Containers . . . 15-Ton Loads

Dinosaur picks up in excess of 30,000 pounds of granular material, white line inside container indicates load has not shifted.

DEMPSTER-DINOSAUR Handles Containerized Cargo, Waste and Raw Materials . . .

The newly developed DEMPSTER-DINOSAUR is a system of materials handling that employs giant containers up to 40 cubic yards and larger. It lends itself to any situation where bulk accumulations of raw materials, liquids, waste or finished products must be handled. Since one truck and one driver can automatically pick up, haul and dump or set down a number of containers, the DINOSAUR easily does the work of several trucks.

Container is shown locked into carrying position.

Two models are available — one for tandem trucks, handles 30,000 pounds; the other, for single axle trucks, handles 22,000 pounds. Special off-the-road models are available for loads limited only by the capacity of the truck.

Free Booklet Offered

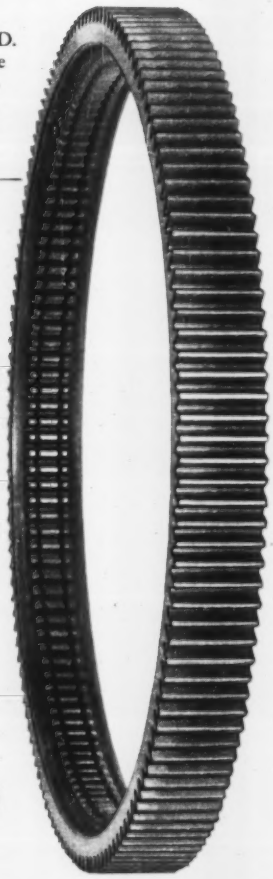
A free booklet which describes the operation of this new system in detail is offered by the manufacturer.

Mfd. By — Patents Pending

DEMPSTER BROTHERS, Inc.

Dept. S-9, Knoxville 17, Tenn.

Snap-ring grooves in this 12″ O. D. thin-section *Reduction Drive Gear* are machined before carborizing and hardening. Both spline and gear teeth are ground and held to .001″ excentricity after hardening the entire gear.



When you

DRIVE

for profits,

GEAR

with

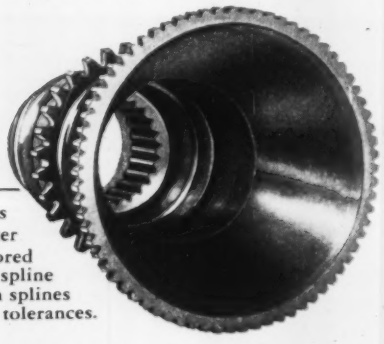
PERKINS

MACHINE AND GEAR CO.

Dept. 4G West Springfield, Mass.

Men who *know* will tell you that custom precision gears made by Perkins can eliminate many design, production and maintenance headaches — literally help you drive for better profits. When you want precision gears in experimental or production quantities, chances are you'll save time and money by checking with Perkins first. What is your gear problem today?

This Handy Gear Calculator, easy to use, saves time. *Folder* illustrating Perkins custom precision gears and facilities offers information. Both yours on request.



Most machining operations on this *Drive Gear Shaft* are performed after localized hardening with the cored areas at Rockwell C42. External spline and gear teeth are ground with splines held to precision tolerances.

ing, but rather it is seen as insurance against slow mill shipments after steelmaking is resumed. The steelmakers, it's said, will need 90 days to clean up orders booked for July, August, and September, when they resume production.

Generally, the placing of fourth quarter orders is being discouraged. If pressed, however, mill sales offices will acknowledge receipt of an order and file it. About the best steel executives can do is to assure regular customers that "we'll have some tonnage for you" and "we'll try to get current as fast as we can."

It will not be surprising if many sheet users get into supply difficulties if the strike goes beyond mid-September. Some consumers have stretched their stocks by scheduling vacation shutdowns for late summer. Even where large stocks are held, including those at auto plants, spot shortages of certain items are bound to act as a check on production schedules, including automotive.

Tin Plate . . .

Tin Plate Prices, Page 125

Can companies have enough tin plate in stock for full operations through September. But their inventories will be far below normal by the time the steel strike ends.

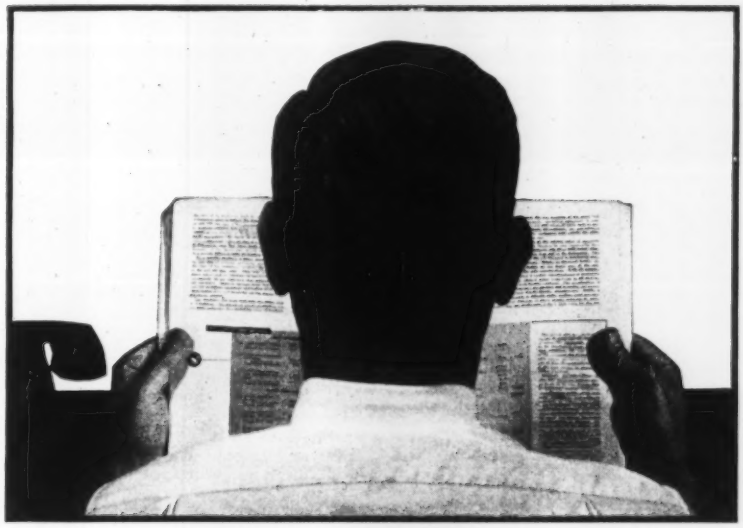
During the last few days, orders have picked up appreciably. Since mill backlogs are so large, the tin mills probably won't be able to ship new bookings before November. Once production is resumed, capacity operations seem assured well into the first quarter of next year.

Because August was abnormally hot, beer consumption has been unusually heavy. In consequence, the can companies may run short of tin plate for beer containers during fourth quarter.

Other factors pointing to heavy use of cans during the fall include a huge corn harvest and increased yields of peas (despite a 20 per cent cut in acreage). In cities where a well advertised soft drink is being test marketed in cans, sales are running 40 per cent ahead of last year's.

Metal can shipments increased during June, reports the U. S. Bureau of the Census. The month's total was 444,711 tons vs. 400,441 in May and 408,778 in June, 1958. The total for the first six months

$1000 REWARD



For the capture of this man's ATTENTION

This is the opportunity you've been looking for—a chance to create a really effective businesspaper advertisement.

YOU CAN EARN $1000

To satisfy this long-time, deep-felt urge—and earn $1000 in the bargain—send us copy and a rough layout for *one* advertisement (any size, color or not, as you see fit). This ad should be capable of attracting the interested attention of industrial advertisers with a stake in the automation market. It should point up the values AUTOMATION magazine holds as a medium for reaching buyers of automatic production equipment.

MORE THAN ONE WINNER

This is not a one-winner contest. AUTOMATION will pay $1000 to the creator of each advertisement it decides subsequently to use as part of its advertising campaign. AUTOMATION editors will be the judges. Contestant's identity will remain anonymous during the judging.

FOR HELPFUL BACKGROUND INFORMATION

Pertinent information about AUTOMATION's market, readers and objectives for use in preparing your entry appears on the back of this page. If you desire additional material, please write and we will send you a booklet supplying complete details.

DEADLINE IS NOVEMBER 30, 1959

The competition is open to all. Anyone with a creative flair is urged to try his skill. Yours may be just the idea we're looking for. Send completed entries to $1000 Reward, c/o AUTOMATION, Penton Building, Cleveland 13, Ohio.

Background Information to Help You Win

$1000 REWARD

(For complete contest details, please see reverse side)

The Marketing Man's Stake in Automation

Automation is the marketing man's challenge today—and in the future. His ideas *must* match this manufacturing concept. The creative marketer realizes that as an absolute first condition, automation requires the establishment of a predictable, stable, and expanding market. Economic and sociological pressures force automation on us; automation forces new marketing concepts on us.

The building of a constant market will require a more complete circuit of communication. Now, the manufacturer-customer flow of information largely goes from the maker to the buyer. But with automation, we will have to know more about what the customer wants. Needed are improved ways to get better communication from maker to user and then back again.

The Management Man's Stake

Automation, or continuous automatic production, naturally will grow out of more complete mechanization. We have progressed from the manual area through the mechanization area and are now well into automation. Any discussion about whether automation is desirable is a futile intellectual exercise. We might as well argue whether the tides and the seasons are desirable.

The dawn of mechanization at the turn of the century brought a new era of lower costs and a higher standard of living than would have been possible in a manually operated economy. Now, we are approaching the upper limits of cost and labor reduction possibilities in a mechanically operated economy. We need a new breakthrough—and it will come through automation.

In the words of D. S. Harder, former Executive Vice President, Basic Manufacturing Divisions, Ford Motor Co.

"Time has proved that the machine age is a boon—not a bugaboo . . . Manufacturers, large and small, have to make a choice. They can heed the warnings of uninformed doom prophets and retard our industrial progress—a road leading to oblivion. Or we can all have faith in ourselves and our ability to harness the potential of this new phase of industrialization for the benefit of all."

The Manufacturing Engineering Function

When industry first backed into automation without precision engineering, it had plenty of trouble. As a result, the manufacturing engineering function developed and has become industry's fastest growing and most important buying influence for automated production equipment.

Industry is changing from a departmentalized approach to a three-phase approach.

Phase One—the processing or work-performing phase, which includes all the steps that alter or combine materials.

Phase Two—the handling phase, which encompasses the movement of materials in process within or between machines.

Phase Three—the control phase, covering the automatic cycling of functions 1 and 2—either independently or integrated.

How AUTOMATION Serves This Function

Edited for men with *manufacturing engineering* interests and responsibilities . . . Automation serves all industries. It reports and interprets all significant advancements and trends relating to automation, including planning, development, design, installation and maintenance. It provides for the exchange of ideas from one industry to another. This cross fertilization is the time-and-money saving link between those who have solved a production process problem and those who are still looking for a solution.

Why Users Read AUTOMATION

Automation is directed particularly to manufacturing engineering and operating management men in industry who are responsible for, or directly interested in, automation. Editorial and advertising pages provide the basis for their decisions concerning the adoption or improvement of automated equipment and manufacturing systems for their own use.

Why Designers and Builders Read It

In addition, Automation appeals to engineers and management men in companies that serve the special automation needs of industry . . . the manufacturing engineering function *to* industry. It gives designers and builders specific job help relating to all types of automated original production equipment . . . from single automatic machines to fully integrated lines and plants.

Reaches a $5 Billion Market

A continuing industry-wide study pinpoints the tremendous potential for Production Equipment, Handling Equipment, Power Drives and Automatic Control Equipment in this vast market controlled by the manufacturing engineering function. This "Survey Report and Automation Forecast" provides you with a new measure of marketing trends. Ask your Automation Representative to show you how to incorporate its data into *your* marketing plans.

Attracts a 90,000 Buyer Audience

Automation's vital readership is concentrated among 90,000 key buying influences . . . the manufacturing engineering and management men who specify, recommend, approve and buy your products. It reaches the important influences of the buying team . . . the men your salesmen don't always get a chance to contact and, yet, would *prefer* to contact.

High Response to Editorial

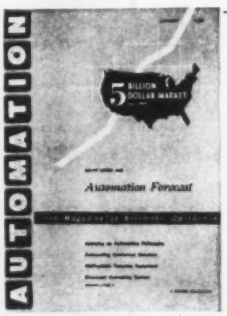
Written by manufacturing engineers for manufacturing engineers . . . Automation is geared to the exact needs and wants of its readers. Its editorial pages clearly communicate—create respect and response! This high level of reader interest is documented by reprint requests (averaging over 130,000 annually) and continually high Starch readership scores.

High Response to Advertising

Every advertisement in Automation is directed to the manufacturing engineering function, production-management men, or the designers of production equipment. No waste circulation . . . for every reader has the *need* to know about these products and the *power* to buy them.

Market Planning Help

You get more effective results from your advertising and help in reaching key automation-minded men in industry, too, with a complete marketing plan which includes: The Penton Census . . . the Continuing Industry-Wide Study of Automation . . . Reader Action Reports . . . Market Data Sheets . . . Starch Scores . . . plus many other Merchandising Aids. Your Automation Representative is prepared to help you make the most of industry's fastest growing and most influential function—*manufacturing engineering.*



Get ACTION from the men who buy and specify . . .

- *Production Equipment*
- *Handling Equipment*
- *Power Drives and Automatic Control Equipment*

AUTOMATION
A Penton Publication
Penton Bldg., Cleveland 13, Ohio

this year was 2,190,212 tons vs. 2,079,674 in the like 1958 period.

Structural Shapes . . .

Structural Shape Prices, Page 123

STRUCTURAL steel bookings and shipments dropped during July, reports the American Institute of Steel Construction. The decline in shipments was due to the steel strike (affecting many large fabricators), but 80 per cent of the institute's members are still booking orders on jobs running up to 300 tons.

July bookings were 259,131 tons, off 11 per cent from the preceding month's total and only slightly below the monthly average for the first seven months this year. Total bookings in the first seven months were 1,871,384 tons, 17 per cent above those in the corresponding 1958 period.

• **Shipments Off Sharply** — Only 238,559 tons were shipped by the fabricators during July, down sharply from the high prestrike June figure of 365,434 tons. The total for the first seven months was 1,889,620 tons.

Backlogs as of July 31 were 1,678,852 tons, of which 1,117,126 tons were scheduled for fabrication in the four months ending Nov. 30.

• **Concerned About Orders**—Broadly, fabricators are more concerned about the lack of new orders than they are over the scarcity of steel. They need certain sizes and specifications of shapes for such new work as they can book, but so far they have been able to fill their needs without too much trouble.

Some New England shops will run short of certain sizes this month, and will turn to the service centers to fill gaps in their inventories.

• **New Labor Agreement**—Boston fabricators have negotiated a new labor contract, establishing an hourly rate of $4.02, including erectors. The increase of several dollars per ton for steel in place is not fully reflected in estimates on new tonnage.

Stainless Steel . . .

Stainless Steel Prices, Page 127

Production and shipments of stainless steel in the first half of 1959 set records, reports the Committee of Stainless Steel Producers, American Iron & Steel Institute.

Shipments at 390,133 net tons were up 71 per cent over the 227,959 reported for the first six months of 1958. Stainless ingot production of 739,764 tons was 95 per cent greater than in the like six months of the preceding year.

The previous record half was in 1956 when the industry produced 614,291 tons and shipped 365,355 tons.

The automotive industry's take in the first half of this year was impressive, totaling 63,923 tons, a gain of 169 per cent over the 23,771 tons taken by that industry in the first six months of 1958. Total shipments for automotive use in all of 1958 was 67,640 net tons.

Shipments to other markets were up uniformly over those in the first half of 1958 as follows: Appliances, utensils, and cutlery, 28,818 tons vs. 17,247; industrial machinery and equipment, 31,317 vs. 20,723; aircraft and missiles, 9908 vs. 6870; warehouses, 152,471 vs. 79,596.

Pig Iron . . .

Pig Iron Prices, Page 128

Merchant pig iron business is holding up surprisingly well. Bookings this month are expected to surpass those in August, which, in turn, were slightly larger than July's.

Foundry operations have been better than generally expected, and there has been more buildup in inventories. Continuation of the steel strike and some labor difficulties at the foundries may retard the improvement. Casting orders could go into a tailspin if the strike persists and matching steel components are unavailable.

No stringency in iron supplies has developed. Some blast furnaces are still operating, and ample inventories of pig iron are maintained at distribution points by several strikebound furnaces. Also, imported iron is available for quick shipment.

Foundries are conserving their iron supplies by using more generous proportions of scrap in furnace charges.

Engineering contracts for J&L's blast furnace at its Cleveland works (STEEL, Aug. 31, p. 58) have been awarded to Arthur G. McKee & Co., Cleveland.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

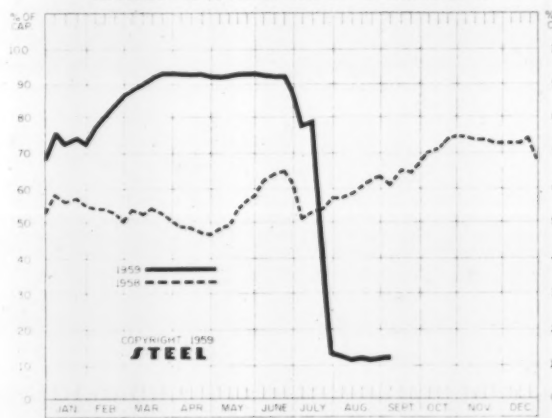
	Week Ended Sept. 6	Change	Same Week 1958	Same Week 1957
Pittsburgh	2	0	55	80.5
Chicago	5	0	67	84
Eastern	10	0	63	85
Youngstown	9	0	50	79
Wheeling	47	1	68.5	92.5
Cleveland	6	0	48.5	80.5
Buffalo	4	0	51.5	100
Birmingham	9	0	52	73
Cincinnati	66.5	+ 5*	77	83
St. Louis	59.5	+ 1.5	79	86.5
Detroit	23.5	0*	74.5	97
Western	6	0	70	94
National Rate	12	+ 0.3*	63	81.5

INGOT PRODUCTION

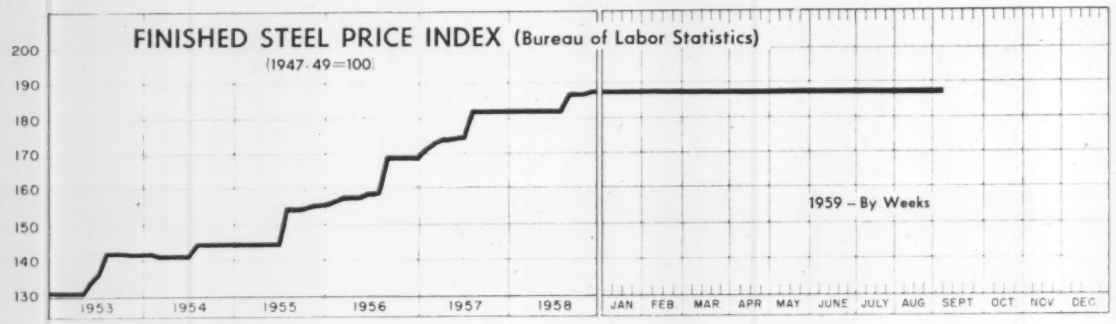
	Week Ended Sept. 6	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	21.2†	20.7	19.8	103.7
NET TONS (In thousands)	340†	332	318	1,666

*Change from preceding week's revised rate.
†Estimated by STEEL; comparative figures reported by AISI.
Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Sept. 1, 1959	Week Ago	Month Ago	Aug. Index	Year Ago
186.7	186.7	186.7	186.7	186.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Sept. 1

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.615
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.658
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.253
		Pipe, Line (100 ft)	199.533
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200	Black Plate, Canmaking Quality (95 lb base box)	7.900
Tubing, Mechanical, Carbon (100 ft)	27.005	Wire, Drawn, Carbon	10.575
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608	Wire, Drawn, Stainless, 430 (lb)	0.665
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100	Bale Ties (bundles)	7.967
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800	Wire, Barbed (80-rod spool)	8.722
		Nails, Wire, 8d Common	9.825
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Sept. 2 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	246.65	194.19
Index in cents per lb	6.713	6.713	6.713	6.682	5.261

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$149.28	$117.77
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	39.00	38.33	38.33	42.67	29.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Sept. 2 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.675	4.30
Bars, H.R., Chicago	5.675	5.675	5.675	5.675	4.30
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.975	4.55
Bars, C.R., Pittsburgh	7.65*	7.65*	7.65*	7.65*	5.40
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.50	4.25
Shapes, Std., Chicago	5.50	5.50	5.50	5.50	4.25
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.77	4.53
Plates, Pittsburgh	5.30	5.30	5.30	5.30	4.225
Plates, Chicago	5.30	5.30	5.30	5.30	4.225
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.30	4.225
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.30	4.225
Plates, Claymont, Del.	5.30	5.30	5.30	5.30	4.225
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Sheets, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Chicago	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Detroit	6.275	6.275	6.275	6.275	5.10
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.875	5.45
Strip, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Strip, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.425	5.75
Strip, C.R., Chicago	7.425	7.425	7.425	7.425	6.00
Strip, C.R., Detroit	7.425	7.425	7.425	7.425	5.60-5.90
Wire, Basic, Pittsburgh	8.00	8.00	8.00	8.00	5.75
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.85
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$99.50	$78.00
Wire rods, ⅜-⅝" Pitts.	6.40	6.40	6.40	6.40	4.675

PIG IRON, Gross Ton

	Sept. 2 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Philadelphia	70.41	70.41	70.41	70.41	49.66
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	50.16
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry(Birm.)deld., Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$38.50	$38.50	$38.50	$42.50	$29.50
No. 1 Heavy Melt, E. Pa.	40.00	40.00	40.00	40.00	27.50
No. 1 Heavy Melt, Chicago	38.50	36.50	36.50	45.50	30.00
No. 1 Heavy Melt, Valley	41.50	41.50	41.50	43.50	30.50
No. 1 Heavy Melt, Cleve.	38.50	38.50	38.50	40.00	28.50
No. 1 Heavy Melt, Buffalo	33.50	33.50	33.50	34.50	26.50
Rails, Rerolling, Chicago	61.50	61.50	59.50	64.50	44.50
No. 1 Cast, Chicago	53.50	53.50	52.50	46.50	35.50

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

Steel Prices

Mill prices as reported to STEEL, Sept. 2, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 124; footnotes, page 126.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$76.00

INGOTS, Alloy (NT)
Detroit S41 .....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 .....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 ....82.00
Munhall,Pa. U5 .....82.00
Sharon,Pa. S3 .....82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ...$82.00
Bessemer,Pa. U5 .....80.00
Buffalo R2 .....80.00
Clairton,Pa. U5 .....80.00
Ensley,Ala. T2 .....80.00
Fairfield,Ala. T2 .....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 .....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2..80.00
Munhall,Pa. U5 .....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 .....80.00
Youngstown R2 .....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 .....99.50
Canton,O R2 .....102.00
Clairton,Pa. U5 .....99.50
Conshohocken,Pa. A3..104.50
Ensley,Ala. T2 .....99.50
Fairfield,Ala. T2 .....99.50
Farrell,Pa. S3 .....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 .....99.50
Geneva,Utah C11 ....99.50
Houston S5 .....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2..99.50
LosAngeles B3 .....109.00
Midland,Pa. C18 .....99.50
Munhall,Pa. U5 .....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 .....109.00
Sharon,Pa. S3 .....99.50
S.Chicago R2, U5, W14..99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ....109.00
Warren,O. C17 .....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 .....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3..126.00
Detroit S41 .....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 .....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 .....119.00
Houston S5 .....124.00
Ind.Harbor,Ind. Y1 ..119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 .....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 .....119.00
Midland,Pa. C18 ....119.00
Munhall,Pa. U5 .....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 .....119.00
S.Chicago R2,U5,W14..119.00
S.Duquesne,Pa. U5 ..119.00
Struthers,O. Y1 .....119.00
Warren,O. C17 .....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$122.50
Canton,O. R2 .....125.00
Cleveland R2 .....122.50
Gary,Ind. U5 .....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ..122.50
Warren,O. C17 .....122.50

SKELP
Aliquippa,Pa. J5 .....5.05
Munhall,Pa. U5 .....5.05
Pittsburgh J5 .....5.05
Warren,O. R2 .....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 .....6.40
Alton,Ill. L1 .....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 .....6.40
Cleveland A7 .....6.40
Donora,Pa. A7 .....6.40
Fairfield,Ala. T2 .....6.40
Houston S5 .....6.65
IndianaHarbor,Ind. Y1..6.40
Johnstown,Pa. B2 .....6.40
Joliet,Ill. A7 .....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 .....6.50
LosAngeles B3 .....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 .....6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 .....6.40
Roebling,N.J. R5 .....6.50
S.Chicago,Ill. R2, W14..6.40
SparrowsPoint,Md. B2..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 .....6.50
Struthers,O. Y1 .....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 .....5.50
Atlanta A11 .....5.70
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa. B2 .....5.55
Birmingham C15 .....5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.30
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Houston S5 .....5.60
Ind.Harbor,Ind. I-2, Y1 5.50
Johnstown,Pa. B2 .....5.55
Joliet,Ill. P22 .....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 .....5.50
Niles,Calif. P1 .....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 .....6.25
Seattle B3 .....6.25
S.Chicago,Ill. U5, W14..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 .....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 .....5.50

Wide Flange
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.50
Fontana,Calif. K1 .....6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
Phoenixville,Pa. P4 .....5.55
S.Chicago,Ill. U5 .....5.50
Sterling,Ill. N15 .....5.50
Weirton,W.Va. W16 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....6.90
Munhall,Pa. U5 .....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 .....8.05
Bessemer,Ala. T2 .....8.05
Bethlehem,Pa. B2 .....8.10
Clairton,Pa. U5 .....8.05
Fairfield,Ala. T2 .....8.05
Fontana,Calif. K1 .....8.85
Gary,Ind. U5 .....8.05
Geneva,Utah C11 .....8.05
Houston S5 .....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 .....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 .....8.75
Munhall,Pa. U5 .....8.05
Seattle B3 .....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 .....7.75
Struthers,O. Y1 .....8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 .....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 .....8.05
S.Chicago,Ill. U5 .....8.05
Sterling,Ill. N15 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 .....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 .....5.30
Ashland,Ky.(15) A10 ..5.30
Atlanta A11 .....5.50
Bessemer,Ala. T2 .....5.30
Clairton,Pa. U5 .....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 .....5.30
Coatesville,Pa. L7 .....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.30
Farrell,Pa. S3 .....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 .....5.30
Geneva,Utah C11 .....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 .....5.40
Ind.Harbor,Ind. I-2, Y1 5.30
Johnstown,Pa. B2 .....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 .....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 .....5.30
Newport,Ky. A2 .....5.30
Pittsburgh J5 .....5.30
Riverdale,Ill. A1 .....5.30
Seattle B3 .....6.20
Sharon,Pa. S3 .....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 .....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 .....5.30
Youngstown U5, Y1 ....5.30
Youngstown (27) R2 ..5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....7.05
Fontana,Calif. K1 .....7.85
Geneva,Utah C11 .....7.05
Houston S5 .....7.15
Johnstown,Pa. B2 .....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 ....13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.95
Ashland,Ky. A10 .....7.95
Bessemer,Ala. T2 .....7.95
Clairton,Pa. U5 .....7.95
Claymont,Del. C22 ....7.95
Cleveland J5, R2 .....7.95
Coatesville,Pa. L7 .....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 .....7.95
Ecorse,Mich. G5 .....7.95
Fairfield,Ala. T2 .....7.95
Farrell,Pa. S3 .....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 .....7.95
Geneva,Utah C11 .....7.95
Houston S5 .....8.05
Ind.Harbor,Ind. I-2, Y1 7.95
Johnstown,Pa. B2 .....7.95
Munhall,Pa. U5 .....7.95
Pittsburgh J5 .....7.95
Seattle B3 .....8.85
Sharon,Pa. S3 .....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 .....7.95
Youngstown U5, Y1 ....7.95

PLATES, Alloy
Aliquippa,Pa. J5 .....7.50
Claymont,Del. C22 ....7.50
Coatesville,Pa. L7 .....7.50
Economy,Pa. B14 .....7.50
Farrell,Pa. S3 .....7.50
Fontana,Calif. K1 .....8.30
Gary,Ind. U5 .....7.50
Houston S5 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 .....7.50
Lowellville,O. S3 .....7.50
Munhall,Pa. U5 .....7.50
Newport,Ky. A2 .....7.50
Pittsburgh J5 .....7.50
Seattle B3 .....8.40
Sharon,Pa. S3 .....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2 ..7.50
Youngstown Y1 .....7.50

FLOOR PLATES
Cleveland J5 .....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ..6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
S.Chicago,Ill. U5 .....6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 .....6.05
Warren,O. c.l. R2 .....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton,Ill. L1 .....5.875
Atlanta (9) A11 .....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 .....5.675
Canton,O. (23) R2 ....6.15
Clairton,Pa.(9) U5 ..5.675
Cleveland(9) R2 .....5.675
Ecorse,Mich.(9) G5 ..5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ..5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 .....5.675
Houston(9) S5 .....5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 ....6.375
Massillon,O. (23) R2 ..6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 ....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle A24, B3, N14 ..6.125
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5. 5.675
S.SanFran.,Calif.(9)B3 6.125
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ...5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11..6.375
Warren,O. C17 .....6.025
Youngstown(9) R2, U5,..5.675

Bars, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.725
Bethlehem,Pa. B2 ....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 .....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 .....6.725
Detroit S41 .....6.725
Economy,Pa. B14 .....6.725
Ecorse,Mich. G5 .....6.725
Fairless,Pa. U5 .....6.875
Farrell,Pa. S3 .....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 .....6.725
Houston S5 .....6.975
Ind.Harbor,Ind. I-2, Y1 6.725
Johnstown,Pa. B2 .....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ..6.725
LosAngeles B3 .....7.775
Lowellville,O. S3 .....6.725
Massillon,O. R2 .....6.725
Midland,Pa. C18 .....6.725
Owensboro,Ky. G8 .....6.725
Pittsburgh J5 .....6.725
Sharon,Pa. S3 .....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 .....6.725
Warren,O. C17 .....6.725
Youngstown U5 .....6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....8.30
Bessemer,Ala. T2 .....8.30
Bethlehem,Pa. B2 .....8.30
Clairton,Pa. U5 .....8.30
Cleveland R2 .....8.30
Ecorse,Mich. G5 .....8.30
Fairfield,Ala. T2 .....8.30
Fontana,Calif. K1 ....9.00
Gary,Ind. U5 .....8.30
Houston S5 .....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 .....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 .....9.00
Pittsburgh J5 .....8.30
Seattle B3 .....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 .....8.30
Youngstown U5 .....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 .....5.925
KansasCity,Mo.(9)S5 ..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 .....5.775
Sterling,Ill.(1) N15 ..5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.675
Atlanta A11 .....5.875
Joliet,Ill. P22 .....5.675
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill. A1 .....5.675
S.SanFrancisco S7 .....6.52
Seattle B3 .....6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 .....6.80
Youngstown U5 .....6.80

BARS, C.F. Leaded (Including leaded extra) Carbon
LosAngeles P2, S30 ..11.75*

Alloy
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12..10.175
Camden,N.J. P13 ....10.35
Chicago W18 .....10.175
Elyria,O. W8 .....10.175
Monaca,Pa. S17 ....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....7.65
BeaverFalls,Pa. M12,R2 7.65
Birmingham C15 .....8.25
Buffalo B5 .....7.70
Camden,N.J. P13 .....8.10
Carnegie,Pa. C12 .....7.65
Chicago W18 .....7.65
Cleveland A7, C20 .....7.65
Detroit B5, P17 .....7.85
Detroit S41 .....7.65
Donora,Pa. A7 .....7.65
Elyria,O W8 .....7.65
FranklinPark,Ill. N5 ...7.65
Gary,Ind. R2 .....7.65
GreenBay,Wis. F7 .....7.65
Hammond,Ind. J5, L2 ...7.65
Hartford,Conn. R2 .....8.15
Harvey,Ill. B5 .....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2 9.10
Mansfield,Mass. B5 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 .....7.65
Monaca,Pa. S17 .....7.65
Newark,N.J. W18 .....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 .....7.65
Plymouth,Mich. P5 ....7.90
Putnam Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 .....7.65
SpringCity,Pa. K3 .....8.10
Struthers,O. Y1 .....7.65
Warren,O. C17 .....7.65
Waukegan,Ill A7 .....7.65
Willimantic,Conn. J5 ..8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19..6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....9.025
BeaverFalls,Pa.M12,R2 9.025
Bethlehem,Pa. B2 .....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 .....9.025
Camden,N.J. P13 .....9.20
Canton,O T7 .....9.025
Carnegie,Pa. C12 .....9.025
Chicago W18 .....9.025
Cleveland A7, C20 .....9.025
Detroit B5, P17 .....9.225
Detroit S41 .....9.025
Donora,Pa. A7 .....9.025
Elyria,O W8 .....9.025
FranklinPark,Ill. N5 ...9.025
Gary,Ind. R2 .....9.025
GreenBay,Wis. F7 .....9.025
Hammond,Ind. J5, L2 ...9.025
Hartford,Conn. R2 .....9.375
Harvey,Ill. R5 .....9.025
Lackawanna,N.Y. B2 ..9.025
LosAngeles P2, S30 ..11.00
Mansfield,Mass. B5 ....9.325
Massillon,O. R2, R8 ....9.025
Midland,Pa. C18 .....9.025
Monaca,Pa. S17 .....9.025
Newark,N.J. W18 .....9.20
Plymouth,Mich. P5 .....9.225
S.Chicago,Ill. W14 .....9.025
SpringCity,Pa. K3 .....9.20
Struthers,O. Y1 .....9.025
Warren,O. C17 .....9.025
Waukegan,Ill. A7 .....9.025
Willimantic,Conn. J5 ..9.325
Worcester,Mass. A7 ....9.325
Youngstown F3, Y1 ....9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 .....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 .....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ....5.925
Kokomo,Ind. C16 ....5.775
Lackawanna,N.Y. B2..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg, Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 ..6.425
S.Chicago,Ill. R2, W14 5.675
S. Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill. (1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ..7.33
St. Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4) F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ....5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland Ky.(8) A10 ..5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit (8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 ....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 ....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 ....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Aliquippa,Pa. J5 .....6.275
Allenport,Pa. P7 .....6.275
Cleveland J5, R2 ....6.275
Conshohocken,Pa. A3..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 ....7.40
Gary Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ..7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ...6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ..9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ....6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ...7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ..6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana, Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 .....7.65
Niles,O. (28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 ....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 ....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W107.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan.San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...5.10
Allenport,Pa. P7 .....5.10
Alton,Ill. L1 .....5.30
Ashland,Ky.(8) A10 ...5.10
Atlanta A11 .....5.10
Bessemer,Ala. T2 .....5.10
Birmingham C15 .....5.10
Buffalo(27) R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa.(25) B2 ..5.10
Lackaw'na,N.Y.(25) B2 5.10
LosAngeles(25) B3 ....5.85
LosAngeles C1 .....8.60
Minnequa,Colo. C10 ....6.20
Riverdale,Ill. A1 .....5.10
SanFrancisco S7 .....6.60
Seattle(25) B3 .....6.10
Seattle N14 .....6.60
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. W14 ....5.10
S.SanFrancisco(25) B3..5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ....5.85
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5 .....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.40
Farrell,Pa. S3 .....8.40
Gary,Ind. U5 .....8.40
Houston S5 .....8.65
Ind.Harbor,Ind. Y1 ....8.40
KansasCity,Mo. S5 ....8.65
LosAngeles B3 .....9.60
Lowellville,O. S3 .....8.40
Newport,Ky. A2 .....8.40
Sharon,Pa. A2, S3 .....8.40
S.Chicago,Ill. W14 ....8.40
Youngstown U5, Y1 ....8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 .....7.575
Bessemer,Ala. T2 .....7.575
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.575
Fairfield,Ala. T2 .....7.575
Farrell,Pa. S3 .....7.575
Gary,Ind. U5 .....7.575
Ind.Harbor,Ind. I-2, Y1 7.575
Lackawanna,N.Y. B2 .7.575
LosAngeles(25) B3 ....8.325
Seattle(25) B3 .....8.575
Sharon,Pa. S3 .....7.575
S.Chicago,Ill. W14 ....7.575
S.SanFrancisco(25) B3..8.325
SparrowsPoint,Md. B2 .7.575
Warren,O. R2 .....7.575
Weirton,W.Va. W6 ....7.575
Youngstown U5, Y1 ....7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...5.35
Warren,O. R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.425
Baltimore T6 .....7.425
Boston T6 .....7.975
Buffalo S40 .....7.425
Cleveland A7, J5 .....7.425
Dearborn,Mich. S3 ....7.425
Detroit D2, M1, P20..7.425
Dover,O. G6 .....7.425
Evanston,Ill. M22 ....7.525
Farrell,Pa. S3 .....7.425
Follansbee,W.Va. W10 .7.425
Fontana Calif. K1 .....9.20
FranklinPark,Ill. T6 ..7.525
Ind.Harbor,Ind. Y1 ...7.425
Indianapolis S41 .....7.575
LosAngeles C1, S41 ....9.30
McKeesport,Pa. E10 ..7.525
NewBedford,Mass. R10..7.875
NewBritain,Conn. S15..7.875
NewCastle,Pa. B4, E5 .7.425
NewHaven,Conn. D2 ..7.875
NewKensington,Pa. A6..7.425
Pawtucket,R.I. R3 ....7.975
Pawtucket,R.I. N8 ....7.975
Philadelphia P24 .....7.875
Pittsburgh J5 .....7.425
Riverdale,Ill. A1 .....7.525
Rome,N.Y.(32) R6 ....7.425
Sharon,Pa. S3 .....7.425
Trenton,N.J.(31) R5 ...8.875
Wallingford,Conn. W2..7.875
Warren,O. R2, T5 ....7.425
Worcester,Mass. A7 ...7.975

STRIP, Cold-Rolled Alloy

Boston T6 .....15.90
Carnegie,Pa. S18 .....15.55
Cleveland A7 .....15.55
Dover,O. G6 .....15.55
Farrell,Pa. S3 .....15.55
FranklinPark,Ill. T6 ..15.55
Harrison,N.J. C18 .....15.55
Indianapolis S41 .....15.70
LosAngeles S41 .....17.75
Lowellville,O. S3 .....15.55
Pawtucket,R.I. N8 ....15.90
Riverdale,Ill. A1 .....15.55
Sharon,Pa. S3 .....15.55
Worcester,Mass. A7 ...15.85
Youngstown S41 .....15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.80
Dearborn,Mich. S3 ....10.80
Dover,O. G6 .....10.80
Farrell,Pa. S3 .....10.80
Ind.Harbor,Ind. Y1 ...10.80
Sharon,Pa. S3 .....10.80
Warren,O. R2 .....10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	....	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	....	18.85	22.95	27.80
Buffalo W12	....	18.85	....	....
Fostoria,O. S1	....	19.05	22.15	....
FranklinPark,Ill. T6	....	19.20	23.30	28.15
Harrison,N.J. C18	....	18.85	22.95	27.80
NewYork W3	....	18.85	22.95	27.80
Palmer,Mass. W12	....	18.85	....	....
Trenton,N.J. R5	....	18.85	22.95	27.80
Worcester,Mass. A7, T6	....	18.85	22.95	27.80
Youngstown S41	....	19.20	23.30	28.15

Weirton,W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....8.175

STRIP, C.R. Electrogalvanized

Cleveland A7 .....7.425*
Dover,O. G6 .....7.425*
Evanston,Ill. M22 ....7.525*
McKeesport,Pa. E10 ..7.50*
Riverdale,Ill. A1 ....7.525*
Warren,O. B9, S3, T5..7.425*
Worcester,Mass. A7 ...7.975
Youngstown S41, Y1..7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3 .....7.50
Sharon,Pa. S3 .....7.50

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Farrell,Pa. S3 .....5.525
Riverdale,Ill. A1 .....5.675
Sharon,Pa. S3 .....5.525
Youngstown U5 .....5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)

IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fontana,Calif. K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Irvin,Pa. U5	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..8.00
Aliquippa,Pa. J5 .....8.00
Alton,Ill. L1 .....8.20
Atlanta A1 .....8.00
Bartonville,Ill. K4 .....8.10
Buffalo W12 .....8.00
Chicago W13 .....8.00
Cleveland A7, C20 ....8.00
Crawfordsville,Ind. M8..8.10
Donora,Pa. A7 .....8.00
Duluth A7 .....8.00
Fairfield,Ala. T2 .....8.00
Fostoria,O.(24) S1 .....8.10
Houston S5 .....8.25
Jacksonville,Fla. M8 ...8.35
Johnstown,Pa. B2 .....8.00
Joliet,Ill. A7 .....8.00
KansasCity,Mo. S5 .....8.25
Kokomo,Ind. C16 .....8.10
LosAngeles B3 .....8.95
Minnequa,Colo. C10 ....8.25
Monessen,Pa. P7, P16...8.00
Palmer,Mass. W12 .....8.30
Pittsburg,Calif. C11 ...8.95
Portsmouth,O. P12 ....8.00
Rankin,Pa. A7 .....8.00
S.Chicago,Ill. R2 .....8.00
S.SanFrancisco C10 ....8.95
SparrowsPoint,Md. B2 ..8.10
Sterling,Ill.(1) N15 ....8.00
Sterling,Ill. N15 .....8.10
Struthers,O. Y1 .....8.00
Waukegan,Ill. A7 .....8.00
Worcester,Mass. A7 ....8.30

WIRE, Cold Heading Carbon

Elyria,O. W8 .....8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4 ....12.65
Buffalo W12 .....13.40
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 .....13.40
KansasCity,Mo. U3 ....12.90
Minnequa,Colo. C10 ....12.775
Monessen,Pa. P7, P16..12.65
Muncie,Ind. I-7 .....13.60
NewHaven,Conn. A7 ...12.95
Palmer,Mass. W12 .....13.70
Pittsburg,Calif. C11 ....13.45
Portsmouth,O. P12 ....12.65
Roebling,N.J. R5 .....12.95
Sparrows Pt.,Md. B2 ...13.50
Struthers,O. Y1 .....13.40
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ....12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3..10.00
LosAngeles B3 .....10.70
Minnequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16 ..9.75
NewHaven,Conn. A7 ....10.05
Palmer,Mass. W12 .....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ....10.70
SparrowsPt.,Md. B2 ....9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Worcester,Mass. A7 ....10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Bartonville,Ill. K4 .....9.85
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Fostoria,O. S1 .....9.80
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3..10.00
LosAngeles B3 .....10.70
Milbury,Mass.(12) N6..10.05
Minnequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16 ..9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 .....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ....10.70
SparrowsPt.,Md. B2 ....9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Wor'ster,Mass.A7,J4,T6 10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....16.50
Bartonville,Ill. K4 ....16.40
Chicago W13 .....16.30
Cleveland A7 .....16.30
Crawfordsville,Ind. M8..16.40
Fostoria,O. S1 .....16.30
Houston S5 .....16.55
Jacksonville,Fla. M8 ..16.65
Johnstown,Pa. B2 .....16.30
KansasCity,Mo. S5 .....16.55
Kokomo,Ind. C16 .....16.30
Minnequa,Colo. C10 ....16.55
Monessen,Pa. P16 .....16.30
Muncie,Ind. I-7 .....16.50
Palmer,Mass. W12 .....16.60
S.SanFrancisco C10 ....17.15
Waukegan,Ill. A7 .....16.30
Worcester,Mass. A7, J6..16.60

WIRE, Tire Bead

Bartonville,Ill. K4 ....17.15
Monessen,Pa. P16 .....17.15
Roebling,N.J. R5 .....17.65

ROPE WIRE (A)

Bartonville,Ill. K4 ....13.45
Buffalo W12 .....13.45
Fostoria,O. S1 .....13.45
KansasCity,Mo. U3 ....13.70
Johnstown,Pa. B2 .....13.45
Monessen,Pa. P7 .....13.45
Muncie,Ind. I-7 .....13.65
Palmer,Mass. W12 .....13.75
Portsmouth,O. P12 ....13.45
Roebling,N.J. R5 .....13.75
St.Louis L8 .....13.45
SparrowsPt.,Md. B2 ....13.55
Struthers,O. Y1 .....13.45
Worcester,Mass. J4 ....13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

Wire, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	12.65
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7, T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburgh,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers: per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) to Distributors (33)

Wheeling,W.Va. W10	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.65
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	9.34

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	9.69

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.59

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

	Col.
Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage) Stone

	An'ld Galv. Stone
Ala.City,Ala.R2	17.85 19.40**
Aliq'ppa,Pa. J5	17.85 19.65
Bartonville K4	17.95 19.80
Cleveland A7	17.85 ....
Craw'dville M8	17.95 19.80†‡
Fostoria,O. S1	18.35 19.90†
Houston S5	18.10 19.65**
Jacksonville M8	17.95 19.80†‡
Johnstown B2	17.85 19.65§
Kan.City,Mo. S5	18.10 ....
Kokomo C16	17.25 18.80†
Minnequa C10	18.10 19.65**
P'lm'r,Mass.W12	18.15 19.70†
Pitts.,Calif. C11	18.20 19.75†
S.SanFran. C10	18.20 19.75**
St'ling(37) N15	17.95 19.80
SparrowsPt. B2	17.95 19.75§
Waukegan A7	17.85 19.40†
Worcester A7	18.15 ....

WIRE, Merchant Quality (6 to 8 gage)

	An'ld Galv.
Ala.City,Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325§
Atlanta(48)A11	9.10 9.775§
Bartonville(48) K4	9.10 9.80
Buffalo W12	9.00 9.55†
Cleveland A7	9.00 ....
Crawfordsville M8	9.10 9.80††
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80**
Jack'ville Fla. M8	9.10 9.80††
Johnstown(48) B2	9.00 9.675§
Joliet,Ill. A7	9.00 9.55†
Kans.City(48) S5	9.25 9.80**
Kokomo(48) S16	9.10 9.65†
LosAngeles B3	9.95 10.625§
Monessen(48) P7	8.65 9.35§
Palmer,Mass. W12	9.30 9.85†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S.Chicago R2	9.00 9.55**
S.SanFran. C10	9.95 10.50**
Spar'wsPt.(48)B2	9 10 9.775§
St'ling(37)(48) N15	9.10 9.80
Struthers,O. Y1	9.00 9.65†
Worcester,Mass.A7	9.30 9.85†

Based on zinc price of: *13.50, †5c, §10c, ‡Less than 10c, ††10.50c, ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:
3 in. and shorter .. 55.0
3¼ in. thru 6 in. .. 50.0
Longer than 6 in. .. 37.0
⅝ in., 3 in. & shorter 47.0
3¼ in. thru 6 in. .. 40.0
Longer than 6 in. .. 31.0
⅞ in. thru 1 in.:
6 in. and shorter .. 37.0
Longer than 6 in. .. 31.0
1⅛ in. and larger:
All lengths 31.0
Undersize Body (rolled thread)
½ in. and smaller:
3 in. and shorter .. 55.0
3¼ in. thru 6 in. .. 50.0

Carriage Bolts
Full Size Body (cut thread) & Undersize Body (rolled thread)
½ in. and smaller:
6 in. and shorter .. 48.0
Larger diameters and longer lengths ... 35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts
½ in. and smaller:
6 in. and shorter .. 48.0
Larger diameters and longer lengths ... 35.0

High Tensile Structural Bolts
(Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)
⅝ in. diam 50.0
¾ in. diam 47.0
⅞ and 1 in. diam 43.0
1⅛ and 1¼ in. diam 34.0

NUTS
(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:
All sizes 56.0
(Full container)

Hex Nuts, Reg. & Heavy
Hot Pressed & Cold Punched:
⅜ in. and smaller.. 62.0
⅞ in. to 1½ in., incl. 56.0
1⅝ in. and larger .. 51.5
Hex Nuts, Semifinished, Heavy (Incl. Slotted):
⅜ in. and smaller.. 62.0
⅞ in. to 1½ in. incl. 56.0
1⅝ in. and larger .. 51.5
Hex Nuts, Finished (Incl. Slotted and Castellated):
⅜ in. and smaller.. 65.0
1 in. to 1½ in., incl. 57.0
1⅝ in. and larger .. 51.5
Semifinished Hex Nuts, Reg. (Incl. Slotted):
⅝ in. and smaller.. 62.0
¾ in. to ⅞ in., incl. 65.0
1 in. to 1½ in., incl. 57.0
1⅝ in. and larger.. 51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)
Hex Head Cap Screws, Coarse or Fine Thread, Bright:
6 in. and shorter:
⅝ in. and smaller.. 35.0
¾, ⅞, and 1 in. .. 16.0
Longer than 6 in.:
⅝ in. and smaller.. 3.0
¾, ⅞, and 1 in. .. +11.0
High Carbon, Heat Treated:
6 in. and shorter:
⅝ in. and smaller.. 20.0
¾, ⅞, and 1 in. .. + 5.0
Longer than 6 in.:
⅝ in. and smaller.. +19.0
¾, ⅞, and 1 in. .. +39.0
Flat Head Cap Screws:
¾ in. and smaller, 6 in. and shorter .. +85.0
Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam:
6 in. and shorter .. + 5.0
Longer than 6 in. .. +29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.85, 7/16 in. and smaller by 6 in. and shorter: 15% off list.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches 1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$28.95	$43.40	$55.40	$73.00	$95.10
Buffalo W12	28.95	43.40	55.40	73.00	95.10
Cleveland A7	28.95	43.40	55.40	73.00	....
KansasCity,Mo. U3	29.85	43.40	55.40	73.00	95.10
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	28.95	43.40	55.40	73.00	95.10
Pittsburg,Calif. C11	....	43.40	55.40	73.00	....
Pueblo,Colo. W12	28.95	43.40	55.40	73.00	95.10
Roebling,N.J. R5	28.95	43.40	55.40	73.00	95.10
SparrowsPoint,Md. B2	28.95	43.40	55.40	73.00	95.10
St.Louis L8	28.95	43.40	55.40	73.00	95.10
Waukegan,Ill. A7	28.95	43.40	55.40	73.00	95.10

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No.2	Tee Rails 60 lb Under
Rails				
Bessemer,Pa. U5	5.75	5.60	....	6.725
Ensley,Aal. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9 60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown B2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.75	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.00	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.55	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base Cold Rolled 10%	Cold Rolled Both Sides
Copper*	$35.85	$42.50

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H 21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.065
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	69.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
Granite City,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up, Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. K2	89.00
Keokuk,Iowa O.H. & Fdry. 12½ lb piglet, 16% Si, K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.42	11.92	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.58#	15.37	9.56	9.27	10.53
Cleveland	8.54[a]	8.79[b]	10.87[a]	52.33	10.32[c]	8.75[d]	11.25#	15.16	9.39	8.71[e]	10.50[f]
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[3]	12.95[3]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.55	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.54[a]	8.79[b]	10.76[a]	52.33	10.30[c]	8.64[d]	11.25#	15.05	9.00	8.47[e]	10.26[f]
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ††includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡⅜ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

[a]10 Ga.; [b]20 Ga.; [c]⅛ x 1 in.; [d]¾-2⅛ in.; [e]¼ x 84 in.; [f]¼ x 36.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Nario, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Canadian Steel

(Cents per pound, f.o.b. mill, except as otherwise noted)

Billets, Blooms & Slabs:	
Carbon, Forging Quality (net ton)	$97.00
Alloy (net ton)	115.00
Wire Rods:	
Carbon, 7/32" to under ¼ in.	5.30
Carbon, ¼ in. to 47/64 in.	5.70
Alloy	6.40
Wire (carload lots)	8.40
Bars & Small Shapes:	
Carbon, merchant quality	5.40
Carbon, special quality	5.85
Alloy	6.40
Bar Mill Bands:	
Carbon	5.40
Alloy	8.05
Structural Size Angles & Zees	5.40
Plates:	
Carbon	5.45
Sheets & Coils, Hot Rolled:	
Carbon Sheets	5.00
Carbon Strip	5.00
Sheets & Coils, Cold Rolled:	
Carbon Sheets	6.35
Carbon Strip (0.050 and lighter)	6.35
Carbon Strip (0.051 and heavier)	6.65
Sheets & Coils, Galvanized:	
Standard Quality	6.70
Culvert Quality	7.00
Sheets, Porcelain Enameling	7.45
Sheets & Coils, Electrical:	
Field Grade	9.00
Armature Grade	9.50
Electrical Grade	10.15
Tin Mill Products (Per Base Box; 100 lb basis wt)	
Coke Tin Plate (1.25 lb pot yield)	$10.60
Electrolytic Tin Plate (0.25 lb coating)	9.10
Black Plate	8.30
Nails, c.l. lots, 400 keg min. (per keg)	$8.15

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.25
100 mesh, pails	9.10§
40 mesh, bags	8.10††
Electrolytic Iron, Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in.	28.75
1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	36.00
Unannealed (99+% Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16 plus 100 mesh)	29.00
Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500-lb drum, freight allowed, c.l. 38.50; ton lots 40.50	
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	33.30-49.50†
Bronze, 5000-lb lots	50.50-54.60†
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	51.50-56.00†
Phosphor-Copper, 5000-lb lots	62.80
Copper (atomized) 5000-lb lots	43.30
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten: Carbon reduced, 98.8% min, minus 65 mesh	Dollars nom**
Chromium, electrolytic 99.8% Cr, min. metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. § Cutting and scrafing grade. **Depending on price of ore. ††Welding grade.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$15.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 91.5c-96.5c nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	$42.00-44.00†
48% 2.8:1	38.00-40.00†
48% no ratio	29.00-31.00†
South African Transvaal	
44% no ratio	19.75-21.00
48% no ratio	29.00-31.00
Turkish	
48% 3:1	51.00-55.00†
Domestic Rail nearest seller	
18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50
Oven Foundry Coke	
Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens:	
New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.68
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.	
Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene one deg (del. east of Rockies)	25.00
Cents per lb, f.o.b. tank cars or tank trucks, deld.	
Phenol, 90 per cent grade	14.75
Per net ton bulk, f.o.b. cars or trucks, plant	
Ammonium sulfate, regular grade	$32.00

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$6.13	$6.13	$6.08	$5.98	$6.44
Bar Size Angles	6.13	6.13	6.08	5.98	6.44
Structural Angles	6.03	6.03	5.98	5.88	6.28
I-Beams	6.03	6.03	5.98	5.88	6.28
Channels	6.03	6.03	5.98	5.88	6.28
Plates (basic bessemer)	5.87	....	5.87	5.77	6.17
Sheets, H.R.	7.00	7.00	6.95	6.85	7.25
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.30	9.30	9.25	9.15	9.65
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	9.45	9.45	9.40	9.30	9.70
Sheets, C.R. (drawing quality)	8.50	8.50	8.45	8.35	8.75
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.22	25.06	24.91	24.61	26.28
Barbed Wire (†)	7.15	7.15	7.10	7.00	7.40
Merchant Bars	6.18	6.18	6.13	6.03	6.43
Hot-Rolled Bands	6.00	6.00	5.95	5.85	6.25
Wire Rods, Thomas Commercial No. 5	6.10	6.15	6.10	6.00	6.35
Wire Rods, O.H.	6.65	6.70	6.65	6.55	6.90
Bright Common Wire Nails (§)	7.65	7.65	7.60	7.50	7.90

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome 1: Cr 63%, C 6% max, Si 7% max, 22c. **Charge Chrome 2:** Cr 50-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

Refined Chrome 1: Cr 50-59%, C 5% max, Si 2% max, 25c. **Refined Chrome 2:** Si 12% max, 24c. Carload, lump, bulk, per lb Cr.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload, bulk, 20.05c per lb of alloy, carload packed, 21.25c, ton lot 22.50c, less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Keokuk, Iowa; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l., lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload, bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅝ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb or briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

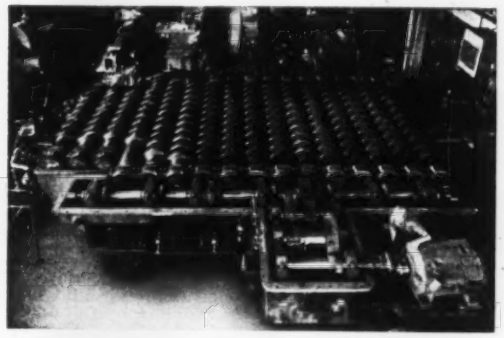
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

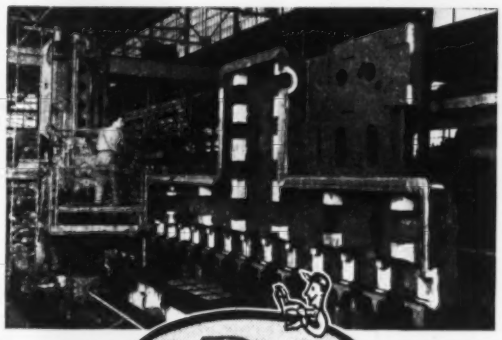
Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.





HEAVY DUTY MACHINING STEEL FABRICATING AND SPECIAL EQUIPMENT

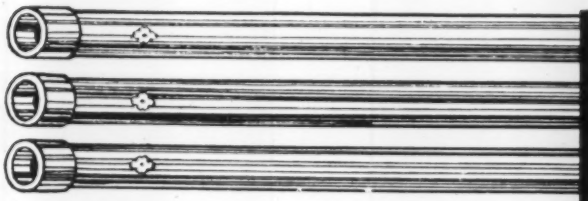
Manufacturers of medium and heavy duty steel mill equipment, weldments, special machinery, jigs and fixtures, and machinery rebuilding. Overhead cranes of 100,000 lb. capacity serve all areas throughout the entire 45,000 square feet of floor space. Serving industry for many years with complete facilities for machining, fabricating and assembly. Also equipped for gas, manual arc, submerged arc and CO_2 welding.

For capable and reliable service . . . call VU 3-3220, or write directly to:

PRODUCTION EXPERTS, Inc.

4255 EAST 49th St.

CLEVELAND 25, OHIO



INCREASE

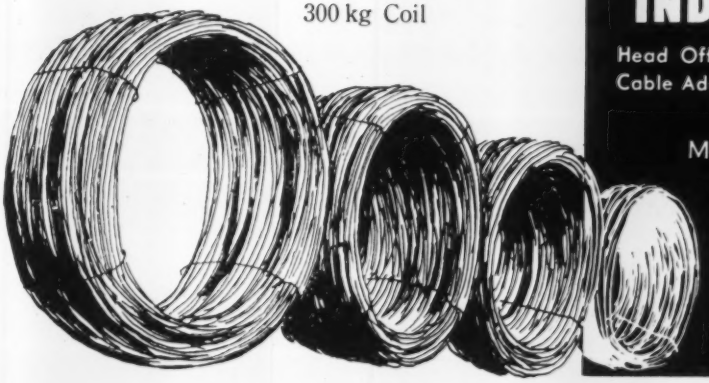
Your Productivity with Our Products!

SUMITOMO METAL INDUSTRIES, LTD.

Head Office : Osaka, Japan

Cable Address: "SUMITOMOMETAL OSAKA"

300 kg Coil



MAIN PRODUCTS

- Steel Tubes & Pipe
- Parts for Rolling Stock
- Rolled Steel Products: Wire Rods, Bars, Shapes, Strip & Hoops

WHY KEEP THE UPKEEP?

MAINTENANCE COSTS		TIME OUT
January	VERY HIGH	22 hours
February	STILL HIGH	17 hours

Switch to the

HKP® PORTER *Hydraulic* ONE-HOSE ROD and BAR CUTTER

IT'S PRACTICALLY . . .

MAINTENANCE FREE!

To slash those sky-high costs on bar and rod cutting operations and maintenance in your mill you need the superbly efficient, rugged, trouble-free one-hose PORTER HYDRAULIC ROD and BAR CUTTER. An all-job team of 3 Cutterheads and 5 Power Unit sizes offers just the right combination to handle any of your cutting work — faster better and at far lower cost. Here's why:

CONTINUOUS TROUBLE-FREE OPERATION

CUTTERHEAD PROTECTION — that eliminates constant "TIME OUT" and HIGH MAINTENANCE COSTS!

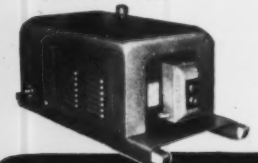
- **LONGER BLADES** with more bearing surface and rigid alignment eliminate side thrust and blade breakage.
- **FILTERED AIR** taken into the cylinder is forced out around the movable blade on each cut — eliminates the danger of dirt reaching bearing surface causing oil leakage and wear.
- **CONCENTRIC DESIGN** eliminates excessive wear of cylinder wall and ram.
- **LARGER CYLINDER AREA** allows the tool to cut capacity stock at a lower operating pressure, resulting in longer life for seal and hose.
- **SAFE, 12 VOLT CONTROL SWITCH** at the cutterhead gives instant finger-tip performance.
- **"KEY-POINT"** wear and replacement reduced to the minimum because of these exclusive HKP features.

A TRUE HYDRAULIC SYSTEM with these efficient, maintenance-saving features:

- **CONTROL VALVE** big and accurate enough for all industrial work. Solenoid operated.
- **EASY TO CHANGE RESERVOIR TYPE 10-MICRON OIL FILTER.**
- **PLUS** many other exclusive HKP features.

Ask to have a Porter Engineer tell you how the 3 CUTTERHEAD sizes and 5 HYDRAULIC POWER UNITS can provide the exact combination for your requirements.

OR — WRITE FOR COMPLETE PORTER HYDRAULIC ROD and BAR CUTTER FOLDER.



ATTENTION! Production and Quality Control Depts. Ask about our **NEW UPSET TESTING MACHINE!**

H. K. PORTER, INC. Somerville 43, Mass.

C ELECTRIC FURNACE STEEL CASTINGS

are engineered to *YOUR* specific requirements

"C" steel castings are CLEAN steel castings of uniform structure that will minimize machining and assembly costs, permit of greater freedom and efficiency of design and add to your product the recognized strength, endurance and desirability of steel. C steel castings, foundry engineered from pattern to finished casting can be had in

CARBON, ALLOY OR STAINLESS STEEL SAND OR SHELL MOULDED

The technical experience and knowledge of our engineering staff are at your service. Write, phone, or call.

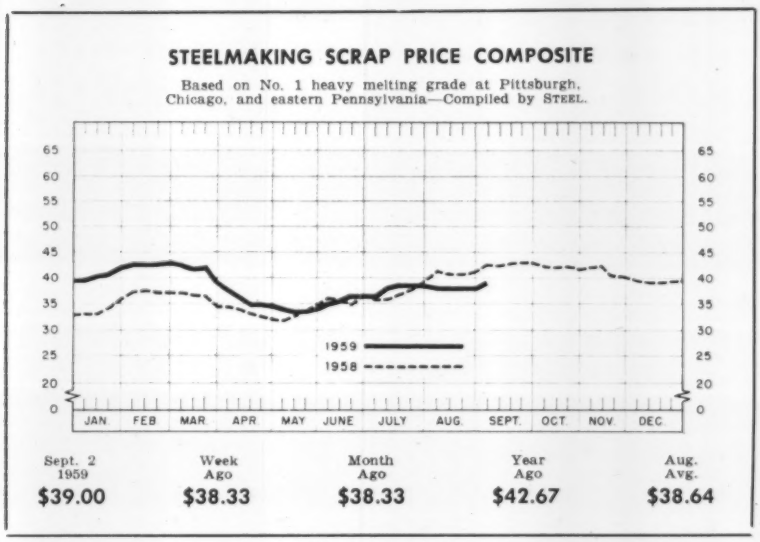
CRUCIBLE STEEL CASTING CO.
LANSDOWNE 2, PENNA.

Metal Cutting Knives *ONLY*

We offer forty years of experience in producing the highest quality Metal Cutting Knives and skilled craftsmen working with the finest materials to exacting tolerances.

A bulletin on "Metal Shearing Aids" will be sent on request.

THE HILL ACME COMPANY
CLEVELAND KNIFE DIVISION
1201 West 65th St. • Cleveland 2, Ohio



New Strength Develops in Scrap

STEEL's composite on No. 1 heavy melting advances 67 cents to $39 as result of higher prices paid by brokers and dealers for auto offerings. Some buy for post strike delivery

Scrap Prices, Page 134

• **Chicago**—Sales of No. 1 factory bundles by auto body plants to brokers and dealers at $43.50 to $45 a ton delivered continue to keep strength in the scrap market even though major district mills are strikebound. The material will be produced and delivered during September at $2 to $2.50 a ton above the successful bid of a mill a month ago. Several other steelmaking grades are up $1 to $2 a ton on sales to unstruck mills. The foundry grades continue strong. The casting shops are using more scrap in their melts to conserve pig iron.

• **Philadelphia**—Prices are steady on steel scrap. The market for the open hearth grades is sustained by good export demand. Two or three cargoes are expected to be loaded here this month. Domestic buying is fair, both by mills that are operating and some of those closed by the strike.

Considerable buying for delivery after the strike is ended is reported generally over the country.

• **New York**—Brokers' buying prices continue strong on the open hearth grades of steel scrap, due primarily to brisk export demand. The cast grades are also strong with domestic consumption holding up well. Trading is slack in such minor grades as borings and turnings, on which quoted prices are nominal.

• **Pittsburgh** — GM's Fisher Body Div. sold its factory bundles to brokers for $45.10 to $45.15 a ton (vs. $45.50 a month ago). Prices of most grades are firm, but dealers are less bullish about the future.

Two factors suggest the market won't go up as much after the strike as some observers have been predicting: 1. Fabricators are generating huge quantities of industrial scrap which they'll return to the mills as soon as the strike is settled. 2. Steelmakers are buying now for delivery after the strike. Result: Consumers won't have to purchase big tonnages in the open market when operations are resumed.

Prices of short shovel turnings and borings will probably rise if the strike lasts much longer. Brokers for a mill on the fringe of the district are offering dealers the same prices

(*Please turn to Page* 139)

things are popping at
SHERATON-CLEVELAND HOTEL

- 100% air-conditioning of all guest rooms, restaurants, and function rooms.
- Major room redecoration (both guest and function rooms).
- Free radio and television in all guest rooms.
- Interior and exterior modernization.
- Now "Reservatron" — World's first electronic hotel reservations service reserves and confirms your reservations in a split second in Sheraton cities from coast to coast in the USA, Canada and Hawaii.
- Many new convention innovations and banquet facilities.
- Modern new Presidential Suite.
- New stores and guest services.
- New charcoal grill specializing in steaks, ribs and chops.
- New popular priced coffee shop "The Minute Chef"—for busy people.
- And many more new developments.

SHERATON-CLEVELAND HOTEL
meal time
night time
any time
Minute Chef
Bronze Room
The Patio
Transit Bar
Public Square • Cleveland, Ohio
TOwer 1-8000

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Sept. 2, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Sept. 2	$39.00
Aug. 26	38.33
Aug. Avg.	38.64
Sept. 1958	42.87
Sept. 1954	29.94

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	38.00-39.00
No. 2 heavy melting	*33.00-34.00*
No. 1 dealer bundles	39.00-40.00
No. 2 bundles	29.00-30.00
No. 1 busheling	41.00-42.00
No. 1 factory bundles	47.00-48.00
Machine shop turnings	19.00-20.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Cut structurals:	
2 ft and under	48.00-49.00
3 ft and under	47.00-48.00
Heavy turnings	34.00-35.00
Punchings & plate scrap	49.00-50.00
Electric furnace bundles	47.00-48.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Stove plate	45.00-46.00
Unstripped motor blocks	33.00-34.00
Clean auto cast	46.00-47.00
Drop broken machinery	52.00-53.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00
Rails, 2 ft and under	58.00-59.00
Rails, 18 in. nd under	59.00-60.00
Random rails	55.00-56.00
Angles, splice bars	53.00-54.00
Railroad specialties	53.00-54.00
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	230.00-235.00
18-8 turnings	115.00-120.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	*39.00-40.00*
No. 1 hvy melt., dealer	*37.00-38.00*
No. 2 hvy melting	*34.00-35.00*
No. 1 factory bundles	*44.00-45.00*
No. 1 dealer bundles	*38.00-39.00*
No. 2 bundles	*25.00-26.00*
No. 1 busheling, indus.	37.00-38.00
No. 1 busheling, dealer	35.00-36.00
Machine shop turnings	19.00-20.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Cut structurals, 3 ft	48.00-49.00
Punchings & plate scrap	49.00-50.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	50.00-51.00
Unstripped motor blocks	44.00-45.00
Clean auto cast	59.00-60.00
Drop broken machinery	59.00-60.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00-42.00
R.R. malleable	59.00-60.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Angles, splice bars	52.00-53.00
Axles	*57.50-58.50*
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	210.00-215.00
18-8 turnings	110.00-115.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	*27.00-28.00*
No. 1 busheling	*44.00-45.00*
No. 1 bundles	*44.00-45.00*
No. 2 bundles	25.00-26.00
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	*45.00-46.00*
Electric furnace bundles	*45.00-46.00*

Railroad Scrap

No. 1 R.R. heavy melt.	43.00-44.00

CLEVELAND

No. 1 heavy melting	38.00-39.00
No. 2 heavy melting	27.00-28.00
No. 1 factory bundles	*44.00-45.00*
No. 1 bundles	*40.00-41.00*
No. 2 bundles	25.00-26.00
No. 1 busheling	*40.00-41.00*
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	40.00-41.00
Cut structurals, plates 2 ft and under	47.00-48.00
Low phos. punchings & plate	*41.00-42.00*
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	*41.00-42.00*

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	36.00-37.00
Brake shoes	36.00-37.00
Clean auto cast	52.00-53.00
Burnt cast	37.00-38.00
Drop broken machinery	52.00-53.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	51.00-52.00
Rails, rerolling	58.00-59.00

Stianless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	125.00-130.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	31.00
No. 1 bundles	39.00
No. 2 bundles	23.00
No. 1 busheling	37.00
Machine shop turnings	14.00
Short shovel turnings	16.00

Cast Iron Grades

No. 1 cupola	54.00
Charging box cast	45.00
Heavy breakable cast	44.00
Unstripped motor blocks	44.00
Clean auto cast	56.00
Stove plate	45.50

Railroad Scrap

No. 1 R.R. heavy melt.	41.00
Rails, 18 in. and under	50.00
Rails, random lengths	45.00
Rails, rerolling	59.00
Angles, splice bars	48.00

BIRMINGHAM

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	38.00-39.00
No. 2 bundles	23.00-24.00
No. 1 busheling	38.00-39.00
Cast iron borings	14.00-15.00
Machine shop turnings	24.00-25.00
Short shovel turnings	27.00-28.00
Bar crops and plates	44.00-45.00
Structurals & plates	*44.00-45.00*
Electric furnace bundles	38.00-39.00
Electric furnace:	
3 ft and under	37.00-38.00
2 ft and under	36.00-37.00

Cast Iron Grades

No. 1 cupola	*54.00-55.00*
Stove plate	*54.00-55.00*
Charging box cast	29.00-30.00
Unstripped motor blocks	42.00-43.00
No. 1 wheels	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 18 in. and under	52.00-53.00
Rails, rerolling	57.00-58.00
Rails, random lengths	46.00-47.00
Angles, splice bars	44.00-45.00

PHILADELPHIA

No. 1 heavy melting	40.00
No. 2 heavy melting	35.00
No. 1 bundles	41.00
No. 2 bundles	27.00-28.00
No. 1 busheling	41.00
Electric furnace bundles	42.00
Mixed borings, turnings	20.00†
Short shovel turnings	24.00
Machine shop turnings	20.00
Heavy turnings	34.00
Structurals & plate	43.00-45.00
Couplers, springs, wheels	46.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	45.00
Drop broken machinery	50.00-51.00
Malleable	67.00-68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	27.00-29.00
No. 1 bundles	30.00-31.00
No. 2 bundles	19.00-20.00
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	12.00-13.00†
Short shovel turnings	13.00-14.00†
Low phos. structurals & plates	36.00-37.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-34.00
Short shovel turnings	21.00-22.00
Machine shop turnings	17.00-18.00
Cast iron borings	19.00-20.00
Low phos structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	44.00-45.00
No. 1 machinery	48.00-49.00

Railroad Scrap

Rails, random lengths	45.00-46.00
Rails, 3 ft and under	51.00-52.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	35.50-36.50
No. 2 heavy melting	30.50-31.50
No. 1 bundles	35.50-36.50
No. 2 bundles	25.00-26.00
No. 1 busheling	35.50-36.50
Machine shop turnings	17.00-18.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	19.00-20.00
Cast iron borings	18.00-19.00
Low phos., 18 in.	46.00-47.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Heavy breakable cast	43.00-44.00
Charging box cast	43.00-44.00
Drop broken machinery	54.00-55.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00-42.00
Rails, 18 in. and under	56.00-57.00
Rails, random lengths	48.00-49.00

HOUSTON

(Exporters' buying prices; f.a.s.)

No. 1 heavy melting	37.00-38.00
No. 2 heavy melting	32.00-33.00
No. 2 bundles	24.00-25.00

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00†
No. 2 heavy melting	31.00†
No. 1 bundles	34.00
No. 2 bundles	20.00†
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	43.00-44.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Heavy breakable	33.00
Foundry malleable	42.00-43.00
Unstripped motor blocks	38.50-39.50

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	25.00-25.50
No. 1 bundles	28.00-29.00
No 1 busheling	28.00-29.00
Machine shop turnings	*9.00-10.00*
Short shovel turnings	11.50-12.00
No. 1 cast	37.00-38.00
Mixed cupola cast	36.00-37.00
No. 1 machinery cast	38.00-38.50

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*33.00-34.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*22.00-23.00*
No. 1 busheling	*33.00-34.00*
Machine shop turnings	12.00-13.00
Mixed borings, turnings	13.00-14.00
Short shovel turnings	*15.00-16.00*

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	38.00-39.00
Heavy breakable	39.00-40.00
Unstripped motor blocks	27.00-28.00
Charging box cast	39.00-40.00
Clean auto cast	*49.00-50.00*

SEATTLE

No. 1 heavy melting	35.00†
No. 2 heavy melting	33.00†
No. 1 bundles	27.00†
No. 2 bundles	22.00†
Machine shop turnings	17.00†
Mixed borings, turnings	17.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	*38.00-39.00**
No. 2 heavy melting	36.00*
No. 1 bundles	*33.00*
No. 2 bundles	*21.00*
Machine shop turnings	16.00
Shovel turnings	*18.00*
Cast iron borings	*18.00*
Cut structurals and plate 1 ft and under	*48.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	39.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	33.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	47.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

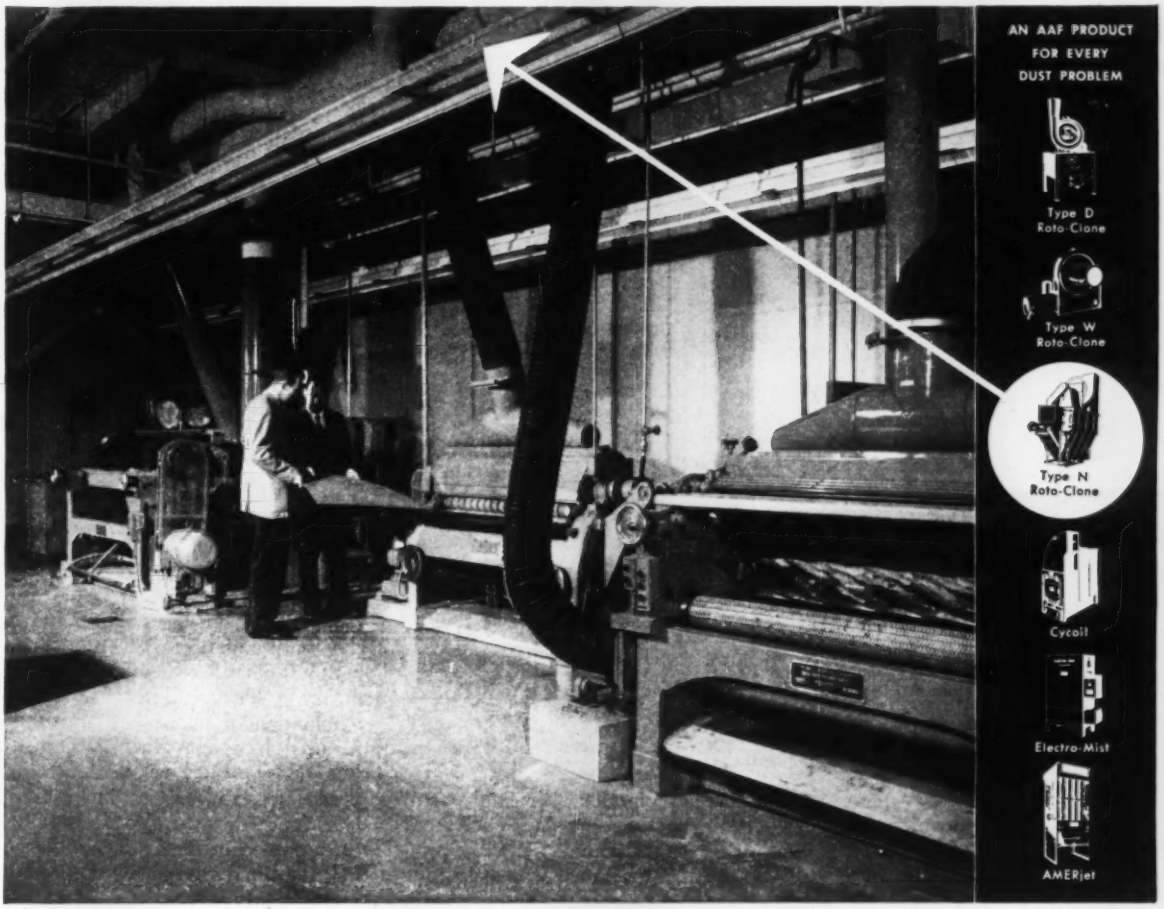
No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory:	
Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

*Delivered to docks.
†Nominal.
‡F.o.b. Hamilton, Ont.

POLISHING



AAF Type N ROTO-CLONES keep polishing operations dust-free

● This sparkling clean polishing area proves that flat-stock polishing need not necessarily be a dirty business. With AAF's wet-collecting Type N ROTO-CLONES continually snuffing out the dust threat, maintenance costs go down, employee morale and productivity go up.

AAF's complete line of dust control equipment was application-developed, now challenges *any* metalworking dust problem, regardless of the metal. Where are troublesome dust, fumes or mists causing you trouble – grinding, buffing, polishing, plating, dry machining, wet machining, heat treating, abrasive cleaning? All can be effectively and economically controlled by AAF.

For the answer to your polishing dust problem, call your local American Air Filter representative, or write direct for Type N ROTO-CLONE Bulletin 277. Address Mr. Robert Moore, American Air Filter Company, Inc., 443 Central Avenue, Louisville, Kentucky.

AAF American Air Filter
BETTER AIR IS OUR BUSINESS

Copper, Zinc Prices Move

Signing of new labor contract by one company spurs upswing in custom smelted copper. Zinc producers hike premiums on high grade, special high grade, alloy ingots

Nonferrous Metal Prices, Pages 138 & 139

AS MAJOR SEGMENTS of the nonferrous industry continue to limp along under the burden of crippling strikes, price activity has become sporadic.

• **Copper Up**—The price of custom smelted copper jumped 3 cents to 33 cents a pound last week. However, the only major custom smelter able to sell at this or any other price is American Metal Climax Inc. That's because the company is the first (and only) copper processor to sign a new labor pact.

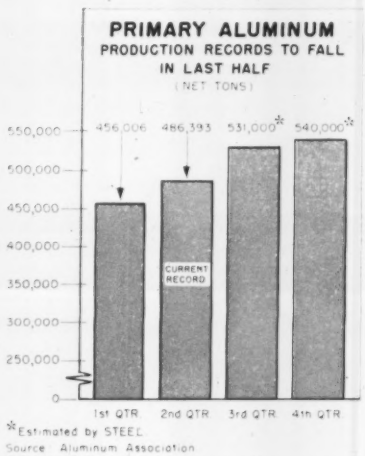
American Metal's new two year contract with the International Union of Mine, Mill & Smelter Workers (at its Carteret, N. J., smelter and refinery) calls for a wage package of 21.6 cents an hour. Breakdown: 1. A 7 cent wage increase retroactive to July 1. 2. Another 7 cents boost to become effective July 1, 1960. 3. Substitution of a noncontributory pension in lieu of the contributory plan previously in effect, which adds 6 cents an hour to wage costs. 4. About 1 cent an hour for improved health and welfare benefits.

Signing of the pact spurred the copper hike. Metalmen say in view of heavy activity on the commodity exchange and the 33-34 cent a pound dealer price, it was necessary to boost the price to attract scrap.

Elsewhere in the copper market things are quiet. Customers continue to gobble up the 25 per cent of domestic primary production still operating. While there are no signs of movement in the primary price (presently 30 cents a pound), observers warn it is under pressure.

Regardless of the Carteret settlement, the industry still believes it's in for a long strike. While the 21.6 cent package is sure to be discussed at the bargaining table, consensus is it won't set a pattern.

• **Zinc Prices Kicked**—While major attention was being focused on copper and lead, zinc producers quietly raised the prices on some items last week. Upped by 0.25 cent a pound were high grade, special high grade, and the diecasting alloy ingots (see new price schedule on the following page). Prime western zinc stays unchanged at 11 cents a pound.



Behind the move was a growing unhappiness about what producers considered the "low" premiums customers were paying for these grades. For example, the premium on special high grade used to be 1.75 cents a pound. It was dropped to 1.25 cents to meet the competition from imported zinc. With quotas limiting imports, better demand, and a strike-caused curtailment in domestic output, pressures to keep the price low disappeared.

• **May Move Again**—Don't be surprised if the premiums are bumped again—at least another 0.25 cent and possibly 0.5 cent. Prime western will rise around 1 cent a pound, guess metalmen, but probably not until the steel strike is settled.

Laborwise, little is new in zinc. The only bright spot is the possibility workers at Bunker Hill Co. will continue on the job on a day-to-day basis.

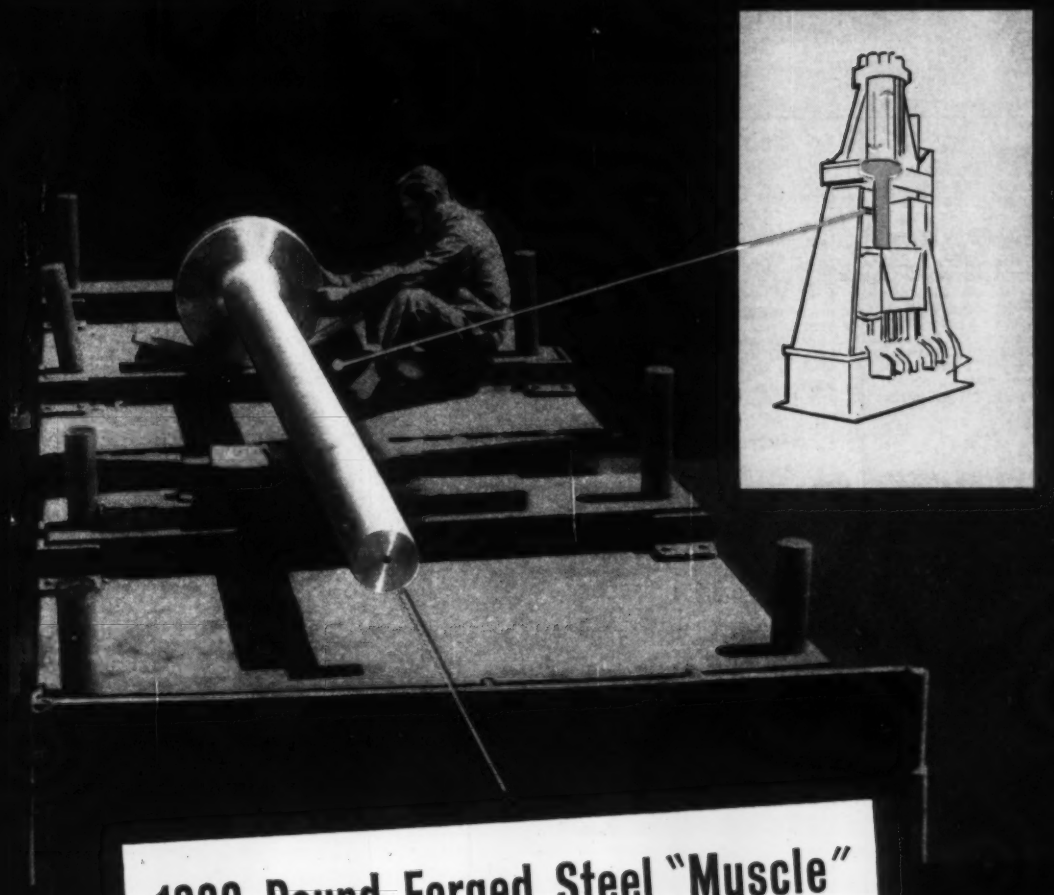
Quotas Take Shellacking

Six lead and zinc producers (representing about 50 per cent of U. S. smelting and refining capacity) have attacked the government's program to stabilize the domestic market via limiting imports of the two metals. They charge ". . . a prolongation of quotas will jeopardize the continuation of a healthy competitive domestic custom smelting industry." They call for: 1. Early elimination of quotas on unmanufactured lead and zinc. 2. Duties, but not so high as to shut out needed foreign supplies and inhibit long range growth of lead and zinc consumption in the U. S., with sufficient differential between metal and ore duties to give domestic smelters an even break in competition for foreign supplies of raw materials. 3. Compensatory duty treatment for a "minimum number" of selected lead and zinc products.

NONFERROUS PRICE RECORD

	Sept. 2 Price	Last Change	Previous Price	Aug. Avg	July Avg	Sept., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.700
Copper	30.00-33.00	Aug. 31, 1959	30.00	30.010	30.048	26.428
Lead	12.80	Aug. 24, 1959	11.80	12.069	11.800	10.730
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	102.375	Sept. 2, 1959	102.625	102.333	102.298	94.120
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. customer custody; MAGNESIUM, pig 99.8%, Velasco, Tex.



1200 Pound Forged Steel "Muscle" For A Steam Hammer...

Forged Steel Piston for Steam Hammer
Hub — 25 inch diameter
Rod Length — 10 feet
Weight — 1200 pounds

Delivering the rated blow to steam hammer sow block and dies, this 1200 pound forged steel piston rod can "dish it out . . . and take it too" A mighty midget muscle controlling a big steel fist that hammers out drop forgings.

Relatively, this is a small but very tough forged component, compared to a 50 ton forged steel bending roll, or a 40 ton rotor for a power turbine.

The point is, however, that this 1200 pound forging is made with the same engineering and metallurgical supervision, the same experienced craftsmanship as the biggest, most critical forging produced in our shops. Quality control from raw material selection to finish machined component is standard operating procedure in our forge shops and foundries.

Let us consult with you before you select your source for steel forgings and castings.

ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. customer custody.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10 000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb nom.

Copper: Electrolytic, 30.00 deld.; custom smelters, 33.00; lake, 30.00 deld.; fire refined, 29.75 deld.

Germanium: First reduction, less than 1 kg, 38.30 per gram; 1-10 kg, 33.30 per gram; 10 kg or more, 31.30 per gram; intrinsic grade, 33.30-35.30 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 per troy oz nom.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 50 lb, $11 per lb, f.o.b. Minneapolis; 50-99 lb, $10; 100-499 lb, $9.50; 500 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $230-232 per 75 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-7.0 in. diam., 50-4999 lb, $8.15-11.50 per lb, depending on quantity; 5000 lb or more, $8 per lb, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.625 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

Tellurium: $2.50 per lb.

Thallium: $7 50 per lb.

Tin: Straits, N. Y., spot and prompt, 102.375.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.60 per lb; grade A-2 (0.5% Fe max.), $1.50 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.25; special high grade, 12.50 deld. Diecasting alloy ingot No. 3, 14.25; No. 2, 14.75; No. 5, 14.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.00-27.75; No. 12 foundry alloy (No. 2 grade), 23.75-24.00; 5% silicon alloy, 0.60 Cu max., 25.00; 13 alloy, 0.60 Cu max., 25.00; 195 alloy 26.75-27.00; 108 alloy, 24.25-24.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.50; grade 2, 23.25; grade 3, 22.25; grade 4, 21.50.

Brass Ingot: Red brass No. 115, 29.25; tin bronze, No. 225, 39.75; No. 245, 33.50; high-leaded tin bronze, No. 305, 33.50; No. 1 yellow, No. 405, 23.75; manganese bronze, No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.895, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.875, f.o.b. Temple, Pa.

COPPER WIRE

Bars, soft, f.o.b. eastern mills, 20,000-lb lots, 35.355; l.c.l., 35.98. Weatherproof, 20,000-lb lots, 36.29; l.c.l., 37.04.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	138	120	138
Strip, C.R.	124	108	138
Plate, H.R.	130	110	126
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	46.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42 40	47 20
5050-F	43 50	48.30
3004-F	44.50	50 20
5052-F	45 10	50 90
6061 T6	45 60	51.70
2024-T4	49 30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76 90	73 90	....	....
0.250	62 00	60 20	89.10	76.60
0.375	61 20	60 00	73.50	68.50
0.500	61 20	60 00	73 50	68.50
0.625	61.20	60 00	69.80	64 20
0.750	59.70	58 40	63 60	60 40
0.875	59 70	58 40	63 60	60 40
1 000	59 70	58 40	63 60	60 40
1.125	57.30	56 10	61 50	58.30
1.250	57.30	56 10	61 50	58 30
1.350	57 30	56 10	61 50	58.30
1.500	57 30	56 10	61.50	58.30
1.625	55 00	53 60	....	56 20
1.750	55 00	53.60	60.30	56 20
1.875	55 00	53 60	....	56 20
2.000	55 00	53 60	60.30	56.20
2.125	53 50	52.10	....	....
2.250	53 50	52 10	....	56.20
2.375	53 50	52.10	....	....
2.500	53.50	52 10	....	56.20
2.625	....	50 40	....	....
2.750	51.90	50 40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50 40	....	56.20
3.125	....	50 40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 42 20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40 alloy 6063-T6 standard length plain ends, 90 000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42 70-44.20	51.30-55.50
12-14	42.70-44.20	52 00-56.50
15-17	42 70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103 10; .081 in., 77.90; .125 in., 70 40; .188 in., 69.00; 250-2.0 in., 67 90. AZ31B spec. grades .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; 250-2.00 in., 93.30. Tread plate, 60-192 in lengths 24-72 in. widths: .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84 60-87.40
12-14	65.30 67 60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 24.25-24.75; No. 2 heavy copper and wire, 22.25-22.75; light copper, 20.25-20.75; No. 1 composition red brass, 18.75-19.25; No. 1 com-

BRASS MILL PRICES

MILL PRODUCTS a

SCRAP ALLOWANCES e (Based on copper at 30.00c)

	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	53.13b	51.36c	....	54.32	26.000	26.000	25.250
Yellow Brass	47.24	32.81d	47.78	50.65	19.625	18.750	17.750
Low Brass, 80%	50.03	47.97	50.57	53.34	22.000	21.750	21.250
Red Brass, 85%	51.02	50.96	51.56	54.33	22.875	22 625	22.125
Com. Bronze, 90%	52.55	52.49	53.09	55.61	23.875	23.625	23.125
Manganese Bronze	55.65	49.24	59.74	....	18.375	18.125	17.500
Muntz Metal	49.95	45.26	....	....	18.375	18.125	17.625
Naval Brass	51.90	45.71	58.46	55.31	18.250	18.000	17.500
Silicon Bronze	59.23	58.42	58.77	76.89	25.500	25.250	24.500
Nickel Silver, 10%	62.85	65.17	65.17	....	24.500	24.250	12.250
Phos. Bronze	73.92	74.42	74.42	75.60	27.125	26.875	25.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20.000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 17.25-17.75; new brass clippings, 15.00-15.50; light brass, 12.00-12.50; heavy yellow brass, 13.00-13.50; new brass rod ends, 13.00-13.50; auto radiators, unsweated, 14.25-14.75; cocks and faucets, 14.75-15.00; brass pipe, 15.00-15.50.

Lead: Soft scrap lead, 8.75-9.25; battery plates, 4.50-4.75; linotype and stereotype, 10.00-10.50; electrotype, 8.25-8.75; mixed babbitt, 9.25-9.75.

Monel: Clippings, 30.00-32.00; old sheets, 26.00-28.00; turnings, 20.00-22.00; rods, 30.00-32.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

Aluminum: Old castings and sheets, 11.50-12.00; clean borings and turnings, 7.25-7.75; segregated low copper clips, 14.75-15.25; segregated high copper clips, 14.25-14.75; mixed low copper clips, 15.00-15.50; mixed high copper clips, 12.25-12.75.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.25-12.75; clean borings and turnings, 10.00-10.50; segregated low copper clips, 17.25-17.75; segregated high copper clips, 16.00-16.50; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.75-16.25.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.50-11.75; clean borings and turnings, 10.50-11.00; segregated low copper clips, 15.75-16.25; segregated high copper clips, 14.75-15.25; mixed low copper clips, 15.25-15.75; mixed high copper clips, 14.25-14.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 56.00; light scrap, 51.00; turnings and borings, 36.00.

Copper and Brass: No. 1 heavy copper and wire, 27.50; No. 2 heavy copper and wire, 25.50; light copper, 23.00; refinery brass (60% copper) dry copper content, 24.50.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 27.50; No. 2 heavy copper and wire, 25.50; light copper, 23.00; No. 1 composition borings, 22.00; No. 1 composition solids 22.50; heavy yellow brass solids, 17.50; yellow brass turnings, 14.50; radiators, 18.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.30.

Copper: Flat-rolled, 46.29; oval, 44.50. 5000-10,000 lb; electrodeposited, 36.00, 2000-5000 lb lots; cast, 41.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb 107.50; 5000-29,999 lb, 105.25, 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 121.50; 200-499 lb, 120.00; 500-999 lb, 119.50; 1000 lb or more, 119.00.

Zinc: Balls, 18.25; flat tops, 18.25; flats, 21.00; ovals, 20.25, ton lots.

CHEMICALS

Cadmium Oxide: $1.30 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 14.95; 2000-5900 lb, 12.95; 6000-11,900 lb, 12.70; 12,000-22,900 lb, 12.45; 23,000 lb or more, 11.95.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 23.80, 400-800 lb, 20.80; 1000-4900 lb, 19.80; 5000-19,900 lb, 18.80; 20,000 lb or more, 17.60.

Sodium Stannate: Less than 100 lb, 80.10; 100-600 lb, 70.70; 700-1900 lb, 68.00; 2000-9900 lb, 66.10; 10,000 lb or more, 64.80.

Stannous Chloride (Anhydrous): 25 lb, 155.60; 100 lb, 150.70; 400 lb, 148.30; 800-19,900 lb, 107.40; 20,000 lb or more, 101.30.

Stannous Sulphate: Less than 50 lb, 140.70; 50 lb, 110.70; 100-1900 lb, 108.70; 2000 lb or more, 106.70.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 133*)

that were paid last month for heavy melting scrap, $38 for No. 1 (delivered) and $33 for No. 2. Secondary material is flowing freely at $33, but some dealers insist that they won't sell No. 1 for less than $42. Small tonnages are available at $38.

• **Cleveland** — The auto lists brought $1 more a ton than they did a month ago, and on the basis of broker and dealer buying, No. 1 factory bundles are now quoted at $44-$45. No. 1 bundles and busheling are up $1 on purchases for electric furnaces. But No. 1 heavy melting remains unchanged at $38-$39 in the absence of demand.

• **Detroit**—The No. 1 grades of scrap are up, following what some dealers and brokers consider surprisingly heavy activity in the auto lists. One reason for the price boost may be that dealers are figuring on selling more tonnage to Ford's mill which is operating.

Some dealers report $40 Canadian orders for bundles. Ford is offering $43, delivered, for cut foundry steel.

• **Buffalo** — The market is firm. Dealers' yard receipts are light, but stockpiles are growing slowly. If the steel strike drags on well into September, it's thought present market firmness may vanish. Cast scrap continues steady.

• **Cincinnati**—Prices are unchanged and are expected to remain firm this week as a large district mill (unaffected by the strike) announces its September buying program.

• **St. Louis**—The market is strong pricewise, but there is not much trading. Dealers are holding to their supplies, hoping for better prices later.

• **Birmingham**—Two cast iron pipe manufacturers returned to the market last week, lowering their buying prices on No. 1 cupola cast and stove plate $1 a ton. The market for foundry grades appears strong, however.

• **Houston**—A firm market is expected here as a result of a Japanese purchase of 1.3 million tons of U. S. scrap for October-March shipment.

MOTORS • GENERATORS
TRANSFORMERS
NEW • REBUILT
ELECTRIC EQUIPMENT CO.
WORLD'S LARGEST INVENTORY
CALL COLLECT GL 3-6783
P.O. BOX 51 • ROCHESTER 1, N.Y.

WIRE FABRIC SALES

National firm desires experienced man as sales manager for sales of mesh and wire products to steel fabricators and wholesalers. Office will be in New Orleans and territory surrounding it. Compensation is salary and incentive program which will interest any top caliber man.

Reply Box 790, STEEL
Penton Bldg. Cleveland 13, Ohio

WORKS MANAGER
INDIA

The manufacturer of steam generating, fuel burning and related equipment (licensee of Combustion Engineering, Inc.) is seeking a General Manager to operate a newly constructed and well equipped boiler manufacturing plant in Calcutta, India. An outstanding career opportunity for the right man, this position is both challenging and rewarding. It offers a salary in keeping with U. S. standards, a liberal contract and other benefits. The successful applicant will be a man who has a thorough knowledge of metal fabrication and machine shop operation as well as the ability to effectively direct the work of other people.

For further information, please write to Box 788, Steel, Penton Bldg., Cleveland 13, Ohio. It would be helpful if you enclosed a copy of your resume.

METALLIZING WIRES
all ferrous and non-ferrous metals
Rigidly Specified for
Metal Spraying
Spra-Rod CORPORATION
2795-T East 83rd St. • Cleveland, Ohio • LOngacre 1-7168

GET CASH NOW
for your idle surplus motors, controls and transformers!
AVAILABLE: NEW MOTORS
Over 5,000 new motors in stock from ¼HP to 200 HP. Special low prices
Write, wire or phone collect!
AJAX ELECTRIC MOTOR CORP.
P.O. Box 561, Rochester 3, N.Y.
Long Distance Phone LO 1-33

CLASSIFIED

Help Wanted

METALLURGICAL ENGINEER for high carbon wire mill. Minimum three years' experience. Work involves manufacturing processes, problems and product responsibility. Will be in direct charge of junior engineer. Address J. A. Turner, John A. Roebling's Sons Division, The Colorado Fuel and Iron Corporation, 640 So. Broad St., Trenton 2, N. J., giving age, experience, education and salary requirements.

METALLURGIST preferably graduate with experience in Ceramic molding, Shaw or Unicast process, casting low and high alloy steel. This is a new position—salary open. Send resume and approximate salary to A. H. Thompson, Personnel Director—Pratt & Letchworth Division, 189 Tonawanda Street, Buffalo 7, New York.

SCRAP PILE STEALING YOUR PROFITS?

It can, you know. For every last piece of it represents money — money that belongs in your profit pile, not your scrap pile.

How do you evict this larcenous lodger? It starts disappearing as soon as you call Wheelock, Lovejoy — your local steel service center. W-L offers an extensive variety of special alloy steels — and you get them *cut-to-size*. By ordering your steel as you need it, you can practically eliminate waste. And you save important floor space by reducing your inventory.

Complete W-L facilities — including expert metallurgical service — are at your disposal *now*. See listing below for the W-L Branch nearest you. For complete technical information on grades, applications, heat treating, etc., write today for your FREE COPY of the Wheelock, Lovejoy Data Book.

W-L STEEL SERVICE CENTERS – Cambridge • Cleveland
Chicago • Hillside, N. J. • Detroit • Buffalo • Cincinnati
AGENTS – Southern Engineering Company, Charlotte, N.C.;
Sanderson-Newbould, Ltd., Montreal & Toronto

WHEELOCK, LOVEJOY & COMPANY, INC.
132 Sidney St., Cambridge 39, Mass.

AMERICAN STEEL WAREHOUSE ASS'N

Industry sources say the area has been drained of scrap by the summer-long exporting activity.

Buying prices, ranging from $37-$38 at Houston, to $40 at New Orleans, are holding unchanged.

Texas brokers have covered a limited purchase by the Mexican mill at Monterrey, and there is no indication when new purchases will be made.

• **Seattle**—Dealers report fair tonnage is moving in anticipation of an early resumption of mill buying. Their inventories are in good shape.

Japan is reported negotiating new business, possibly involving 100 cargoes.

• **Los Angeles** — The market appears easy despite continued heavy exports. Quotations on some grades are down a little from where they were a week ago.

Strike's Impact on Scrap Use Less than Expected

Consumption of purchased scrap in June by steel mills and foundries declined slightly, reports the Institute of Scrap Iron & Steel Inc. Estimated purchased scrap consumption was 2,440,000 gross tons in the month, down 232,000 from May, but well ahead of June, 1958, when consumption was 1,867,000 tons.

Since the start of the steel strike, consumption has dropped sharply, but many of the mills that have continued to operate are large users of scrap. In addition, many closed mills have been buying for later delivery, and the foundries have continued to make purchases right along.

In areas remote from the mills (principally by reason of high rail freight rates) the improved, though relatively modest export market has helped sustain dealers, reports E. C. Barringer, executive vice president of the institute. All in all, he says, the impact of the strike has not been as great as had been expected.

The institute's statistical report shows receipts of purchased scrap in June at 2,432,000 gross tons. Total consumption of home and purchased scrap by the steel mills and foundries was 6,324,000 tons. The report also shows scrap export licenses in July rose to 636,000 tons, highest in many months. Exports in June totaled 360,638 gross tons.

Advertising Index

Abell-Howe Co. 108
Acme Chain Corporation 6
Acro Welder Mfg. Co. 16
Aetna-Standard Division, Blaw-Knox Co. ..... Inside Back Cover
Air Reduction Sales Co., A Division of Air Reduction Co., Inc. 26
Ajax Electric Motor Corporation 139
Aluminium Limited Sales, Inc. 54
American Air Filter Co., Inc. 135
American Steel & Wire Division, United States Steel Corporation 30, 31
Armstrong-Blum Mfg. Co. 39
Automotive Gear Division, Eaton Manufacturing Co. ..... Inside Front Cover

Bethlehem Steel Co. 1
Blaw-Knox Co., Aetna-Standard Division ..... Inside Back Cover
Bliss, E. W., Co., Mackintosh-Hemphill Division 27
Branson Ultrasonic Corporation 66
Buffalo Forge Co. 19

Cement Gun Co. 114
Chambersburg Engineering Co. 21
Cleveland Worm & Gear Co., The 4
Colorado Fuel & Iron Corporation, The 25, 139
Columbia-Geneva Steel Division, United States Steel Corporation 30, 31, 76, 77
Columbus McKinnon Chain Corporation 141
Crucible Steel Casting Co. 132
Crucible Steel Company of America 56, 57

Dempster Brothers, Inc. 117
DoAll Co., The 79
Dodge Manufacturing Corporation 14
Drake Hotel, The 82
Duraloy Co., The 10
Dynapak Convair, A Division of General Dynamics Corporation 68

Eaton Manufacturing Co., Automotive Gear Division ..... Inside Front Cover
Elastic Stop Nut Corporation of America 103
Electric Equipment Co. 139
Erie Forge & Steel Corporation 137

Foster, L. B., Co. 16
Fuji Iron & Steel Co., Ltd. 81

Garlock Packing Co., The 11
Gates Rubber Co., The 74, 75
General Dynamics Corporation, Dynapak Convair Division 68
Gisholt Machine Co. 24
Globe Brick Co., The 116
Gorton, George, Machine Co. 84
Great Lakes Steel Corporation 22, 23

Handy & Harman 20
Harris Foundry & Machine Co. 110
Hill Acme Co., The, Cleveland Knife Division 132
Houghton, E. F., & Co. 2

Inland Steel Co. 42
International Nickel Co., Inc., The 40

Jessop Steel Co. 73
Jones & Laughlin Steel Warehouse Division .. 53

Kirk & Blum Manufacturing Co., The 80

Logan Co. 78
Lukens Steel Co. 64

Mackintosh Hemphill Division of E. W. Bliss Co. 27
Mahon, R. C., Co., The 33
Mesta Machine Co. 97
Metal & Thermit Corporation 95

National Steel Corporation 22, 23
Nebel Machine Tool Corporation, Nebel Lathe Division 7
Nicholson File Co. 15

Ohio Knife Co., The 99
Olin Mathieson Chemical Corporation 85

Pacific Industrial Manufacturing Co. 28, 29
Perkins Machine & Gear Co. 118
Porter, H. K., Inc. 132
Production Experts, Inc. 131

Ransburg Electro-Coating Corporation 104
Republic Steel Corporation 8, 9
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 139
Ryerson, Joseph T., & Son, Inc. 34

St. Joseph Lead Co. 142
Sealmaster Bearings, A Division of Stephens-Adamson Mfg. Co. 107
Scovill Manufacturing Co., Mill Products Division 17, 18
Sheraton-Cleveland Hotel 133
Snyder Corporation 63
Somers Brass Co., Inc. 67
Spra Rod Corporation 139
Stephens-Adamson Mfg. Co., Sealmaster Bearings Division 107
Sterling National Industries, Inc. 82
Sumitomo Metal Industries, Ltd. 131
Superior Tube Co. 32

Tennessee Coal & Iron Division, United States Steel Corporation 30, 31, 76, 77
Texaco, Inc. 12, 13
Thomas Machine Manufacturing Co. 114
Thompson, Henry G., & Son Co., The, Machine Tool Division 112
Timken Roller Bearing Co., The ..... Back Cover
Tomkins-Johnson Co., The 83
Torrington Co., The, Specialties Division 115

United States Rubber Co., Mechanical Goods Division 60
United States Steel Corporation, Subsidiaries 30, 31, 76, 77
United States Steel Export Co. 30, 31, 76, 77

Warner & Swasey Co. 3
Washington Steel Corporation 109
Westinghouse Electric Corporation 71
Wheelock, Lovejoy & Co., Inc. 140
Wyman-Gordon 86

~ ~ ~

Table of Contents

Facing Inside Front Cover

Classified Advertising, Page 139

CM

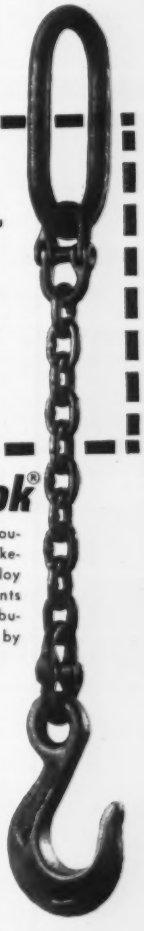
HERC-ALLOY®

the original alloy steel chain

Assemblies are now available with a choice of coupling links:

WELDED coupling links
...the type with which you are thoroughly familiar.

DETACHABLE coupling links
the CM Hammerlok used by leading plants since 1955.



CM Hammerlok®

The "do-it-yourself" reusable coupling link that permits you to make-up or rebuild your own Herc-Alloy assemblies with all components furnished by your local distributor. Simple and safe. Endorsed by leading alloy chain users.

CALL YOUR CM DISTRIBUTOR or write for helpful literature on alloy chain assembly, care, use and inspection.

CM CHAIN

COLUMBUS McKINNON
CHAIN CORPORATION
Tonawanda, New York
NEW YORK • CHICAGO • CLEVELAND
LOS ANGELES • SAN FRANCISCO
Warehouses: San Francisco, Los Angeles, Portland, Salt Lake City and Dixon, Ill.
In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ontario

Hot-Dip Galvanizing Replaces Painting

...and Proves A Life Preserver For Highway Life Guards

It is estimated that road building to the extent of six billion dollars will make 1959 the biggest highway construction year since Congress, in 1956, authorized the 41,000 mile interstate highway system.

Last year, as a part of this continuing program, 11 miles of hot-dipped galvanized guard rail were installed on the Pennsylvania Turnpike near Somerset, Pa. The rail was galvanized after fabrication and delivered to the site as needed. Under normal conditions, construction crews installed an average of 3000 feet per day. For complete protection against atmospheric corrosion, galvanized bolts were used to fasten the rails in place. This type of double faced guard rail has become increasingly popular especially on older highways where narrow medial strips are a hazard.

Noteworthy is the proven fact that the ultimate cost of hot-dip galvanizing is lower than painting because it eliminates the recurrent expense of *re-painting*.

Here is an example

The hot-dip galvanized bridge railing shown here was installed on the Merritt Parkway near Milford, Conn. in 1938. *In the ensuing 20 years it has retained its appearance and strength without painting.* This is just one of the many installations where galvanized steel is saving the nation's Highway Departments millions of maintenance dollars every year. Thanks to the protective zinc coating, galvanized highway structurals are immune to atmospheric corrosion and have the added advantages which the inherent strength of steel provides.

ASTM SPECIFICATIONS

Steel products to be galvanized after fabrication, and approved for installation on inter-state highways, are covered by ASTM Spec. A123 and apply to:

- Bridge Structurals
- Decking and Railing
- Grating
- Fence Posts
- Sign and Reflector Supports
- Expansion Plates
- Rocker Plates
- Guard Rails
- Lighting Standards

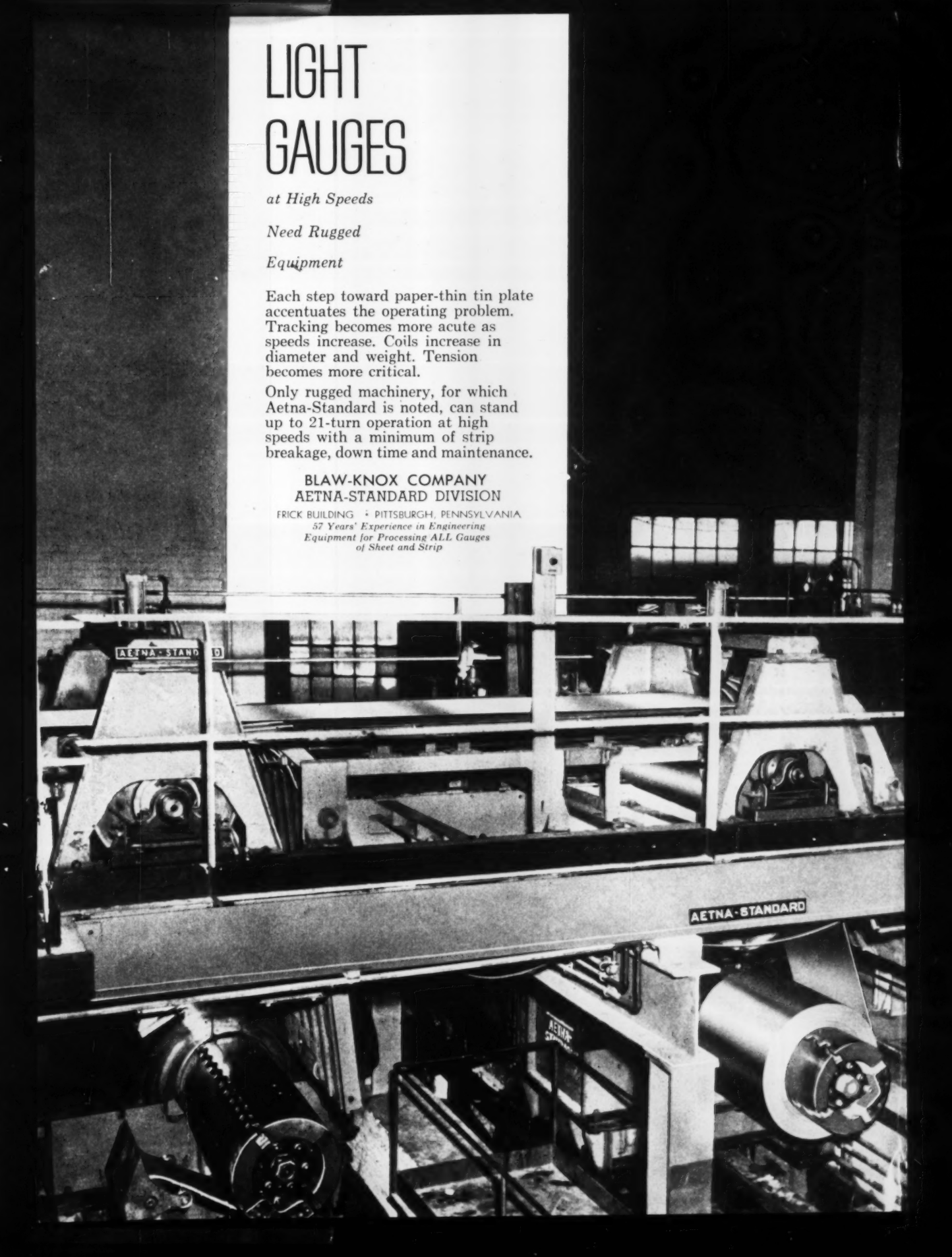
NOTE: ASTM Spec. A123 corresponds in most cases to a similar specification of the American Assoc. of State Highway Officials, e.g., ASTM A123 is the same as AASHO Spec. M111-55.

ST. JOSEPH LEAD COMPANY

ST. JOE

250 Park Avenue
New York 17, N. Y.

ZN-137



LIGHT GAUGES

at High Speeds

Need Rugged

Equipment

Each step toward paper-thin tin plate accentuates the operating problem. Tracking becomes more acute as speeds increase. Coils increase in diameter and weight. Tension becomes more critical.

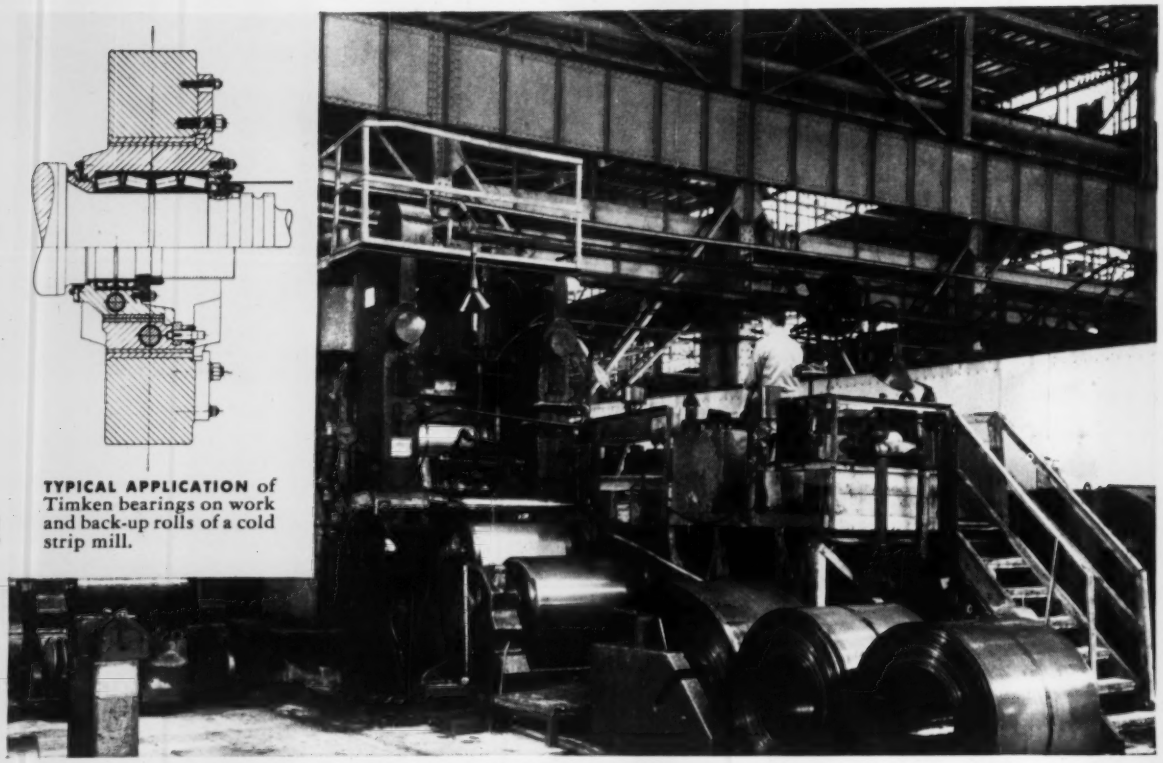
Only rugged machinery, for which Aetna-Standard is noted, can stand up to 21-turn operation at high speeds with a minimum of strip breakage, down time and maintenance.

BLAW-KNOX COMPANY
AETNA-STANDARD DIVISION

FRICK BUILDING • PITTSBURGH, PENNSYLVANIA

57 Years' Experience in Engineering Equipment for Processing ALL Gauges of Sheet and Strip

TYPICAL APPLICATION of Timken bearings on work and back-up rolls of a cold strip mill.



Inland Steel boosts bearing load capacity 50% —just by switching to Timken® bearings

BY switching to Timken® bearings on the roll necks, Inland Steel obtained a 50% gain in load capacity with no increase in power demand on the 4-high cold reversing mill above. Longer bearing life resulted, too. What's more they gained these advantages without sacrifice of compact design. With previous bearing designs, momentary overloads caused premature failures. And low permissible screw down pressures limited rolling practice.

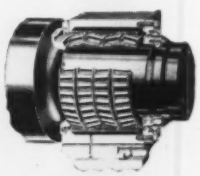
Timken roll neck bearings are used in over 1,000 mill installations around the world to assure minimum cost per ton of steel rolled. That's because: 1) *They roll the load*—virtually eliminate friction. Timken bearings have tapered design to take both radial and thrust loads. 2) *They are precision manufactured*—assuring close control of product gauge. 3) *They minimize maintenance;* Modern Timken roll neck bearings are designed to provide the best combination of bearing capacity, rigidity and roll neck strength for a given mill roll diameter. Bearings and roll necks stand up longer under load. Grease or oil mist lubrication provides further economies. And, 4) *They give longer bearing life.* Mill records show that service life of Timken back-up roll bearings has been obtained in excess of 12,000,000 tons of steel rolled. They're case-carburized to take shock and the full-line contact between rollers and races gives them extra load-carrying capacity.

When you buy or build a mill, make certain you buy the best in bearing performance and engineering service—specify Timken bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

BETTER-NESS rolls on

TIMKEN®

tapered roller bearings



First in bearings for 60 years

WHEN YOU BUY TIMKEN® BEARINGS YOU GET...

1. Quality you can take for granted
2. Service you can't get anywhere else
3. The best-known name in bearings
4. Pace setter in lower bearing costs